

Chapter 4
DOE Responses to the Public Comments

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CHAPTER 4

DOE RESPONSES TO THE PUBLIC COMMENTS

The formal U.S. Department of Energy (DOE) responses to the public review comments on the Draft Environmental Impact Statement (DEIS) are presented in this chapter. Each response is accompanied by a comment code (refer to Section 3.2 in this appendix) unique to the comment that it addresses. This code may be used to locate the exact text of the comment in Section 3.4.2 of this appendix. If a comment resulted in the revision of text for the Final Environmental Impact Statement (FEIS), the locations of the revisions are indicated beneath the responses.

COMMENT CODE

F-1-1

We recommend that the final document include more site specific information relating to water resources, ecological resources, cultural resources, human health, support facilities and infrastructure, long-term productivity of the environment, and lastly, cumulative impacts resulting from construction and operation. The DEIS assesses these impacts at a general level. We recommend including site specific NEPA analysis or information so that each of the identified potential impacts for each facility are fully assessed.

RESPONSE

The DEIS contains sufficient information to determine the environmental impacts of the proposed action at each of the alternative sites. The information presented in the EIS 1) is the best currently available given the level of design work allowed to be completed; 2) was corroborated through reconnaissance level surveys at all four locations; and 3) is adequate to support a siting and construction decision among the four alternative locations. The analysis in the EIS is intentionally designed to conservatively anticipate or "bound" all of the foreseeable environmental impacts at each location, not to present details about the site required to actually go forward with construction. Once DOE identifies the selected site in its Record of Decision, the agency will begin detailed design work and prepare additional evaluations, including a three-season survey for protected species, detailed archeological survey, geotechnical investigation, building placements, and other reviews. While these studies will substantially expand our information base for the construction site they normally would not call into question the facts or assumptions in the EIS analysis. In the unlikely event that the additional analyses identify significant new information or adverse environmental impacts beyond those identified in this FEIS, the Department would prepare a supplemental EIS.

COMMENT CODE

F-1-2

We were unable to find anywhere in the DEIS a request for an alternate methodology for demonstration of compliance with the Radionuclide NESHAPs. It is unclear whether DOE intends to seek such approval for the values provided within the DEIS. The values DOE has provided for ede, with the pathways of exposure chosen, are presented as having to meet the 10 millirem per year ede dose standard for all public exposures. Prior US EPA approval must be obtained for any alteration of Clean Air Act Assessment Package 1988 (CAPP88-PC). This includes other radionuclides of concern. If this prior approval is not sought and obtained, the calculated ede exposures cannot be accepted as being adequately protective of public health and safety. We recommend that if this is not the case, then that the request, along with the approval letter be provided in this EIS.

RESPONSE

DOE did not intend the EIS to include a request for an alternate methodology for demonstration of compliance with the radionuclide National Emissions Standards for Hazardous Air Pollutants (NESHAPs). DOE has not made a decision on seeking such approval. After the Record of Decision is issued identifying the selected site for construction of the SNS, DOE would consult with the appropriate State agencies and EPA to determine the most efficient method of compliance with the Radionuclide NESHAPs.

The reference to the 10 mrem annual dose limit (40 CFR Part 61) was included to show that DOE expects the facility to be within this limit. Further explanation of this has been included in the FEIS.

LOCATION OF EIS REVISION(S): Sections 5.2.9.2.1, 5.3.9.2.1, 5.4.9.2.1, 5.5.9.2.1

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COMMENT CODE

F-1-3

We recommend that DOE clarify the state authorities for each alternate site. For example, the State of Illinois Environmental Protection Agency has not authorities delegated to it with regards to the Radionuclide NESHAPs, or radiation in any form. Radiation issues for the State of Illinois is dealt with by the Illinois Department of Nuclear Safety, which also has no delegated authority for the radionuclide NESHAPs. All enforcement authority resides with the United States Environmental Protection Agency, Region 5 office for radionuclide NESHAPs issues. The DEIS needs to be changed to reflect this confusion.

RESPONSE

EPA has delegated authority for the regulation of Radionuclide NESHAPS to the Tennessee Department of Environment and Conservation (TDEC). The authority to regulate Radionuclide NESHAPS in New Mexico, Illinois, and New York is retained by EPA. The text of the EIS has been revised to indicate this distribution of regulatory authority.

LOCATION OF EIS REVISION(S): Table 6.1-1 and Section 6.1.1

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COMMENT CODE

F-1-4

The DEIS should address how operation of the facility would contribute to radionuclide emissions in the atmosphere and how it would contribute to the existing NESHAP reports.

RESPONSE

Section 6.1.1 summarizes the requirements of NESHAP. Based on the information presented in Sections 5.2.9.2.1, 5.3.9.2.1, 5.4.9.2.1, and 5.5.9.2.1, DOE anticipates the need for a NESHAP Permit to Construct. The effective dose equivalent caused by all potential emissions from SNS operations is projected to be greater than 1 percent of the 10 millirem per year NESHAP standard.

The current annual NESHAPs reports from the site selected in the Record of Decision for construction of the SNS would be modified to include the radioactive emissions from the SNS.

LOCATION OF EIS REVISION(S): Section 6.1.1

COMMENT CODE

F-1-5

While the EIS contains tables which provide monitoring data for all of the criteria pollutants for 1996, it does not state whether or not ANL and BNL are in areas classified as non-attainment or maintenance of the National Ambient Air quality Standards (NAAQS). If they are in non-attainment or maintenance status they would be subject to the general conformity rules (40 CFR Part 93: "Determining Conformity of General Federal Actions to State or Federal Implementation Plans"). The final EIS should address both the status of all of the alternatives and the applicability of the general conformity rule.

RESPONSE

The Illinois Environmental Protection Agency (IEPA) and the New York State Department of Environment and Conservation (NYSDEC) were contacted to obtain information pertinent to addressing this comment. The proposed SNS sites at ANL and BNL are in nonattainment areas for ozone only. Both areas are listed as severe nonattainment for this criteria pollutant. The proposed SNS sites at Oak Ridge National Laboratory (ORNL) and LANL are not located in such areas. Text stating the air quality attainment status for this criteria pollutant in DuPage County (ANL location in Illinois) and Suffolk County (BNL location in New York) have been added to the text of the FEIS (Sections 4.3.3.3 and 4.4.3.3).

Because the proposed SNS sites at ANL and BNL are located in severe nonattainment areas, regulations (40 CFR 93) under the Clean Air Act require DOE to demonstrate that the proposed action would conform to the State Implementation Plans for ozone in Illinois and New York. Text pertinent to this demonstration has been added to the FEIS (Sections 5.4.3.2 and 5.5.3.2).

LOCATION OF EIS REVISION(S): Sections 4.3.3.3, 4.4.3.3, 5.4.3.2, and 5.5.3.2

COMMENT CODE

F-1-6

The DEIS states that the Till formation at Argonne is classified as having low permeability which renders this formation unusable. EPA believes this groundwater information is inaccurate. It has been well documented that the Wadsworth Till formation possess extensively high yielding sand and gravel seams. Although several municipalities in the Chicago land area have recently switched to using Lake Michigan water as a potable source, several private residences in northeastern Illinois are still dependent on shallow groundwater as a potable supply source. EPA recommends that further consideration must be given to potential impacts to shallow ground water resources in the area.

RESPONSE

Information obtained and reviewed concerning geologic conditions at the ANL site indicate that the sands found in the Wadsworth Till formation are localized and do not represent a large scale regional formation (see Sandia National Laboratory, 1996. *Performance Evaluation of the Technical Capabilities of DOE Sites for Disposition of Mixed-Low-Level Waste*, Volume 5. DOE/ID-10521, March). Thus, the major portion of the underlying geological formation at the ANL site consists of silty clay with extremely low permeability. Accordingly, despite the localized high-yield portions of sands, the overall low permeability of the silty clay should minimize the potential for offsite groundwater migration from the SNS site. Groundwater within the Silurian dolomite and Ordovician sandstone layers under the property is used as a drinking water supply by ANL and neighboring communities. However, no documentation of

drinking water wells within the Till formation was observed. The text of the EIS has been modified to better describe shallow groundwater movement at the ANL site.

As discussed in the DEIS, appropriate mitigation measures, including construction of an earthen shielding berm, would be undertaken to minimize potential impacts to the groundwater at the site. If during the investigation of the selected site it is found that soil conditions and groundwater travel times do not agree with the assumptions used in the EIS, the design of the earthen berm would be modified to assure that the severity of the impacts to groundwater would not be greater than those expressed in the FEIS.

LOCATION OF EIS REVISION(S): Section 4.3.2.3

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COMMENT CODE

F-1-7

The document references several conflicts surrounding the siting of the SNS at the preferred alternative, ORNL. As noted, an Oak Ridge citizens advisory organization, the End-Use Working Group, has drafted land use guidelines and recommendations for the DOE – Oak Ridge Operations. One of the draft guidelines recommends the siting of additional DOE facilities at ORNL on brownfield sites instead of greenfield sites (Page S-17). EPA has an initiative – the Brownfields Economic Redevelopment Initiative – designed to empower stakeholders in economic redevelopment of abandoned industrial areas to clean up and reuse brownfields. We note that DOE is currently participating in the Interagency Working Group on Brownfield development [DOE contacts are Martha Crosland 202-568-5793 and Chris Camillo 202-401-3819, April 1997 data]. We recommend that the Final EIS examine the potential for using brownfield sites for the SNS project. Instead of committing 110 acres of hardwood and pine forest habitat for this project, EPA Region IV supports the examination of brownfield sites within ORNL to determine what sites might serve DOE's needs in this regard.

RESPONSE

The process of selecting the preferred site for construction of the SNS on the Oak Ridge Reservation was a two phase process. In the first phase, the entire reservation was screened to eliminate areas that were not suitable for construction of the SNS. Brownfield and greenfield areas of the reservation were both included. Areas of land within the ORR with waste area groupings, environmental restoration projects or waste management areas were eliminated from consideration because these areas would require cleanup, with some attendant uncertainty on the extent of cleanup required, prior to excavation for the SNS foundations. This activity could increase worker exposure to radioactive and nonradioactive contaminants and would require the disposal of material removed during clean up in a licensed land fill. This could affect both the budget and schedule of the project. Working in a contaminated area could increase labor costs and disposal costs of the contaminated materials. Coordinating with the Environmental Management program for the cleanup of these areas may resolve the budget issue, however, long schedule delays may result. Coordination of this construction effort with the requirement of RCRA or CERCLA for cleanup of these areas could add a year or more to the construction schedule of the SNS. Siting the SNS in a waste management area could require cleanup of the area, with associated cost increases and schedule delays, and possibly the relocation of waste management activities likely. The result of this first phase was the identification of four candidate sites, however, none of these were brownfield sites.

The second phase consisted of a comparative evaluation of the candidate sites using specific site evaluation criteria. One of the Functional Criteria was the avoidance of contaminated soils. One of the Health and Safety criteria was avoiding existing hazardous materials areas and waste areas (i.e. Waste Area Groups and RCRA sites). Again, these criteria were included to avoid the increased risk to

construction workers and the increased costs and schedule delays associated with placing a large scale construction project at a site with contaminated soils or hazardous materials.

LOCATION OF EIS REVISION(S): Sections S 1.4.2 and 3.2.4.2

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COMMENT CODE

F-1-8

A potential conflict at the ORNL site stems from on-going environmental monitoring and ecological research projects in the proposed project area (Page S-17) being conducted by National Oceanic and Atmospheric Administration/Atmospheric Turbulence and Diffusion Division (NOAA/ADD). The proposed site is situated within a buffer zone designed to protect an ecological monitoring project from carbon dioxide and other pollutant emissions. The Final EIS needs to include: a) how long the NOAA/ADD monitoring project are expected to continue; b) what is the projected building schedule of the SNS project, including the proposed upgrade to peak operation to the proposed build-out of 4 MW beam; and c) indicate if there are any of the NOAA/ADD ecological monitoring projects that can be completed prior to addition to the atmosphere of combustion products from the natural gas-fired boilers at the proposed SNS site.

RESPONSE

National Oceanic and Atmospheric Administration/Atmospheric Turbulence and Diffusion Division (NOAA/ATDD) personnel cannot specify a precise duration period for their continuing environmental monitoring activities in the Walker Branch Watershed. However, their general plan is to continue for an indefinitely long period of time. The text of the EIS has been revised to reflect these general plan.

The projected site preparation and construction periods for the proposed SNS are shown in Figure 3.2.2-1 of the EIS. At this time, DOE cannot specify when the eventual SNS upgrade to an operating power of 4 MW would occur, since it is not definite that the upgrade will be necessary.

If natural gas-fired boilers are installed in the proposed SNS, emissions would begin in the late fiscal year (FY) 2005 date, the start of operations (Figure 3.2.2-1). The NOAA/ATDD monitoring in the Walker Branch Watershed would not be completed by this date. The anticipated durations and completion dates for the ORNL Environmental Sciences Division (ESD) ecological research projects in the Walker Branch Watershed are shown in Tables 4.1.8.2-1, 4.1.8.3-1, and 4.1.8.3-2 of the EIS.

LOCATION OF EIS REVISION(S): Section 4.1.8.3

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COMMENT CODE

F-1-9

EPA requests that the final EIS includes discussion on avoidance and reduction of wetland impact, as well as, mitigation necessary to offset unavoidable wetland impacts.

RESPONSE

Appendix H, Floodplains/Wetlands Assessment of Potential Impacts at the Oak Ridge National Laboratory and Argonne National Laboratory, has been included in the EIS. This appendix describes the potentially affected wetlands, the potential impacts to the wetlands, the potential cumulative impacts to wetlands, and the potential mitigation measures to minimize these impacts. If a final site for the proposed SNS is selected, DOE will prepare a Mitigation Action Plan to explain how and when mitigation

measures would be implemented and how DOE would monitor the mitigation measures over time to ensure their effectiveness.

LOCATION OF EIS REVISION(S): Appendix H

COMMENT CODE

F-1-10

Our limited review indicates that based upon population, health impacts, and groundwater issues, that the best site for the facility would be LANL. We would suggest that additional information be provided explaining why Oak Ridge is the preferred alternative.

RESPONSE

Based on population and health impacts, DOE agrees that, the preferred site for the proposed SNS might have been LANL. However, there are other aspects of the proposed LANL site that detract from its suitability (e.g., the lack of sufficient electrical capacity and the impacts associated with providing the water necessary for the facility). The preferred alternative, the proposed ORNL site, has advantages such as easy access to adequate utilities. In addition, this location allows DOE to take advantage 1) of the highly trained scientific and technical staff who operate and utilize the reactor-based neutron source at ORNL; 2) of the design experience for neutron sources gained during conceptual design of the Advanced Neutron Source; and 3) of the existing advanced materials program at ORNL.

DOE will identify the environmentally preferred site in the Record of Decision. The final decision would take into account other issues besides the environmental analysis presented in the EIS. The Record of Decision will contain a full explanation of the decision.

LOCATION OF EIS REVISION(S): Sections S 1.2.2. and 3.2.4.2.

COMMENT CODE

S-1-1

The Illinois site has no significant agricultural impacts since it is located on the grounds of the Argonne National Laboratory. The site consists of support service buildings, open space, and undeveloped ecological plots. If any agricultural land remains on the site, its viability for long-term agricultural use would be very low given the development that has occurred around it. Land use plans designate the area for nonagricultural uses. The IDOA would have no objection to the project if the Argonne National Laboratory was eventually chosen for the site of the SNS.

RESPONSE

DOE appreciates the comment.

COMMENT CODE

S-1-2

1. It is the responsibility of the USDA Natural Resources Conservation Service (NRCS) to determine whether a site is subject to the provisions of the federal Farmland Protection Policy Act. Section 4.3.1.3 (Soils), page 4-117 of the DEIS indicates that the preparer of the DEIS has made this decision rather than the NRCS.

RESPONSE

The provisions of the Farmland Protection Policy Act are implemented through the federal regulations in 7 CFR 658. The regulations in 7 CFR 658.4 (a) state that a federal agency "...may determine whether or not a site is farmland as defined in Sec. 658.2(a) or the agency may request that NRCS make such a determination." In accordance with this regulation, DOE has elected to make its own determinations as to the presence or absence of farmland on the proposed sites for the SNS.

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COMMENT CODE

S-1-3

2. Numerous references to "open space" were made in the DEIS. The term need to be defined in the glossary. If the term includes farmland, then farmland needs to be broken out and assessed separately. Farmland is a natural resource and a land use just like wetlands, woodlands, and prairies, etc. Impacts to this natural resource must be properly evaluated in the NEPA documents.

RESPONSE

The term "open space" is a formal land use category applied to areas of land that exist in a predominantly natural, undeveloped state. This definition has been added to the Glossary in the FEIS. No farmland is present within open spaces or at any other location within the ORR, LANL, ANL, or BNL.

DOE agrees that farmland is both a natural resource and a land use. The text of the FEIS has been revised to more clearly indicate that potential effects on farmland were evaluated.

LOCATION OF EIS REVISION(S): Glossary, Table S 1.5.2-1 (1a) (1b), Table 3.5-1 (1a) (1b),
Sections 4.1.1.3, 4.2.1.3, 4.3.1.3, 4.4.1.3, 5.2.1.3, 5.3.1.3, 5.4.1.3,
5.5.1.3, 5.7.1.1, 5.7.2.1, 5.7.3.1, 5.7.4.1

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COMMENT CODE

S-2-1

Considering the information provided, we find that the area of potential effect for this undertaking contains no cultural resources eligible for listing in the National Register of Historic Places. You should notify interested persons and make the documentation associated with this finding available to the public.

RESPONSE

DOE acknowledges this finding of the Tennessee Historical Commission. A December 29, 1997, letter documenting this finding was included in Appendix D of the DEIS (see page D-11).

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COMMENT CODE

S-2-2

If you agency proposes any modifications in current project plans or discovers any archaeological remains during the ground disturbance or construction phase, please contact this office to determine what further action, if any, will be necessary to comply with Section 106 of the National Historic Preservation Act.

RESPONSE

Should the ORNL site be selected, DOE would consult with the Tennessee Historical Commission concerning any proposed modifications in current project plans that could affect cultural resources. Such consultations would also occur if cultural resources were encountered during the ground disturbance or construction phase of the proposed action.

COMMENT CODE

S-3-1

Our staff has reviewed the “Draft Environmental Impact Statement for the Construction and Operation of the Spallation Neutron Source” dated December 1998. We understand from the draft EIS that the proposed location for the project is the 800 Area at Argonne National (sic) Laboratory-East. Recently Building 829 was determined as not eligible for listing on the National Register of Historic Places. At this time, our office is not sure if there are any other buildings located in the 800 area. Even though these buildings may be less than fifty years old, if they are located in the 800 Area they should be assessed for National Register eligibility.

RESPONSE

Buildings 809, 826, and 829 were standing in the 800 Area at ANL when the text of the DEIS was first written. Subsequently, the DOE Chicago Operations Office consulted with the Illinois State Historic Preservation Officer (SHPO) concerning the cultural resources status of these buildings. As a result of these consultations under Section 106 of the National Historic Preservation Act (NHPA), none of these buildings were determined to be eligible for the National Register. Buildings 809 and 826 were demolished as part of an ongoing building removal program in the 800 Area. Subsequently, Building 829 is the only remaining Historic Period building in the 800 Area at ANL. The text of the FEIS has been revised throughout to indicate the current historic resources environment of the 800 Area.

LOCATION OF EIS REVISION(S): Tables S 1.5.2-1 (7a) and 3.5-1 (7a); Sections 4.3.7.2, 5.4.7.2, and 5.7.3.7.2

COMMENT CODE

S-3-2

The process set forth in Table S 1.5.2-1 (page S-36) of the EIS for addressing possible impacts to prehistoric site 11DU207, if Argonne (sic) National Laboratory were selected for construction of the Spallation Neutron Source, is acceptable to our office. If you have any further questions, please contact Tracey A. Sculle, Cultural Resource Manager, at 217/785-3977 or Joseph S. Phillippe, Staff Archaeologist, at 217/785-1279.

RESPONSE

DOE appreciates concurrence of the Illinois Historic Preservation Agency with the proposed process for management of prehistoric site 11DU207.

COMMENT CODE

S-4-1

- Threatened and Endangered Species. While no listed species are known to occur on the exact site for the SNS, several have been observed within the limits of ANL and the adjacent Waterfall Glen Forest Preserve. Surveys for the Kirtland’s snake, red-shouldered hawk, and their respective habitats should be performed if ANL is chosen for the SNS.

RESPONSE

DOE agrees with this comment. In Section 5.4.5.4 of the DEIS, DOE commits to a three season survey of the proposed site at ANL for protected species and their habitats. This survey would be completed at the ANL site if it is selected in the Record of Decision as the site for construction of the SNS. The survey would be completed prior to the start of construction.

COMMENT CODE

S-4-2

- Waterfall Glen Forest Preserve District. The DuPage County Forest Preserve District should be consulted for impacts to Waterfall Glen, one of the county's largest preserves.

RESPONSE

DOE agrees with this comment. If the ANL site is selected in the Record of Decision for construction of the SNS, DOE will consult with the DuPage County Forest Preserve District concerning potential impacts to the Waterfall Glen Forest Preserve.

COMMENT CODE

S-4-3

- Stream Resources. While the Department does not have authority over the floodways on the two small tributaries on the ANL site (because they both drain less than one square mile), a permit may be needed from the Department's Office of Water Resources if an impoundment is proposed. Additionally, any proposal to alter the streams on site should have a thorough macroinvertebrate and fish survey.

RESPONSE

DOE agrees with this comment and understands that a permit may be needed from the Illinois Department of Water Resources if an impoundment is included in the design of the SNS. If the ANL site is selected in the Record of Decision for construction of the SNS, DOE would consult with the Illinois Department of Natural Resources concerning details of macroinvertebrate and fish surveys that would be performed prior to the alteration of any streams on ANL.

COMMENT CODE

S-4-4

- Wetlands. Before a permit is sought from the Department of Environmental Concerns and the US Army Corps of Engineers to fill or alter any wetland, a thorough floristic survey should be performed to determine appropriate mitigation strategies.

RESPONSE

DOE agrees with this comment. If ANL is selected as the site, DOE will consult with the Illinois Department of Natural Resources, the Department of Environmental Concerns and the U.S. Army Corps of Engineers (USACOE) to determine the type and extent of biotic surveys to be conducted in wetlands that may be altered to determine appropriate mitigation strategies. DOE also will prepare a mitigation action plan to explain how and when mitigation measures would be implemented and how DOE would monitor the mitigation measures over time to ensure their effectiveness.

COMMENT CODE

S-5-1

...(1) the design life and decontamination and decommissioning (D&D) plans for the facility and

RESPONSE

Appendix A

The SNS is being designed to operate for 40 years beginning in 2006. DOE estimates that the facility would be producing neutrons for scientific research approximately 75 percent of this time, or 30 years. Thus, 30 years was used in the DEIS to determine the amount of activation products produced. Advances in technology over the next 46 years may allow the life of the facility to be extended beyond 40 years, provided there is a continued need for the facility.

The proposed action of this EIS does not include decommissioning of the proposed SNS. The scope of this EIS includes construction and operation of the proposed facility. DOE will prepare a decommissioning plan for the SNS at the selected site after release of the Record of Decision and before the start of construction. This plan will include estimates of the amount of scrap and wastes that would be generated during decommissioning of the facility. At present, DOE estimates the cost of decommissioning the facility to be 150 million dollars (year 2006 dollars) (Spallation Neutron Source Project Execution Plan; SNS/97-1). DOE has also committed to prepare the appropriate National Environmental Protection Act (NEPA) documentation prior to decommissioning the facility.

COMMENT CODE

S-5-2

...(2) health and safety, including radiologically activated and contaminated materials.

RESPONSE

Health and safety issues, discussed generally in Section 6.1.10, are site specific and are assessed after the selection of a site in the Record of Decision. Specific health and safety issues will then be addressed in project safety documents (Safety Analysis Report/Safety Assessment document). This site-specific report would be prepared after release of the Record of Decision, but prior to construction of any facilities. All activities dealing with radiologically activated and contaminated materials would be subject to regulations in 10 CFR 835 Occupational Radiation Protection.

COMMENT CODE

S-5-3

It is the State of Tennessee's understanding that the SNS will be designed, constructed, and operated in a manner that is compliant with applicable laws, regulations and DOE Orders. The DEIS needs additional information to clearly demonstrate groundwater protection requirements, radioactive wastewater treatment capacity to support ORNL's active waste management, environmental restoration waste and SNS waste needs.

RESPONSE

Because of the uncertainties in the amount of soil activation products and uncertainties regarding the site-specific groundwater at the ORNL site, the analysis in the EIS is based on very conservative assumptions. The results of these analyses present what DOE considers to be an upper limit of releases to groundwater. After publication of the ROD, detailed groundwater characterization at the site would indicate what design features would need to be incorporated into Title I and Title II design to ensure protection of the groundwater.

The analysis in the EIS indicates that ORNL can accommodate the radioactive wastes expected to be generated by the SNS. This conclusion is based on the best available information at this time; the SNS would not begin generating wastes until the year 2006.

COMMENT CODE

S-5-4

The State will expect best available technology in design and construction for pollution prevention, emission controls, and monitoring. It will also expect adequate funding for compliant treatment, storage and disposal of waste.

RESPONSE

DOE agrees with the State of Tennessee and commits to developing detailed design and constructing the SNS using the best available technology for pollution prevention, emissions controls, and monitoring. DOE will also provide sufficient funding to meet all regulatory requirements for the construction and operation of the SNS including treatment, storage, and disposal of wastes.

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COMMENT CODE

S-5-5

Several environmental health and safety issues, including radiologically activated and/or contaminated materials, need to be addressed. Possible release of radiological materials to the environment during future upgrades to the facility should be addressed in the Final EIS. According to page A-15 of the Draft EIS, it may be ten years after initial operation before the power is upgraded to 4 megawatts. Significant radioactivity levels may have been reached in various facility locations and equipment by that time subjecting the public and environment to undue risks unless proper precautions are taken.

RESPONSE

DOE expects very limited release of radiological materials, well within the limits of applicable regulations, to the environment during future upgrades to the SNS. The source terms used in the analyses of potential exposures to radiation in the DEIS were very conservative. The SNS would be designed to operate within the envelope described in the DEIS. All construction associated with upgrading the facility would be subject to regulations in 10 CFR 835 Occupational Radiation Protection. This document sets the limits of radiation release and worker exposures that DOE will comply with during the facility upgrades. The planned upgrades, if implemented, would be constructed while the SNS is operational and would entail a minimal amount of disassembly of previously constructed facilities. The upgrades would include construction of new facilities, e.g. the second accumulator ring and the second target and experimental building, and connection of these facilities to the existing linear accelerator and accumulator ring.

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COMMENT CODE

S-5-6

In addition, a more thorough examination of transport of radiological components through the soil and groundwater is required. Design criteria should include protection of groundwater from any contamination including leaching of radionuclides from neutron activated soil.

RESPONSE

Section 3.2.2.9 presents the shielding design for the linear accelerator and accumulator rings. The design is an engineered earthen berm designed to isolate the activation products generated by the particle beam. In Chapter 5 the potential impacts to groundwater are presented. These impacts are based on very conservative assumptions concerning groundwater travel times, dilution, and levels of radionuclides in the earthen berm (see Section 5.2.2.3.2). The results of this analysis present a bounding estimate of the potential impacts. This bounding estimate becomes the maximum design limit for Title I and Title II (preliminary and detailed) design, that takes place after the publication of the Record of Decision. If,

during the investigations of the selected site, it is found that soil conditions and groundwater travel times do not agree with the assumptions used in the EIS, the design of the earthen berm would be modified to assure that the severity of the impacts to groundwater would not be greater than expressed in the EIS.

A discussion of transport of radionuclides for each of the four alternative sites is presented in Chapter 5 of the DEIS (Sections 5.2.2.3.2, 5.3.2.3.2, 5.4.2.3.2, and 5.5.2.3.2). Because of the uncertainties in the amount of soil activation products and uncertainties about the groundwater at each of the four sites, these analyses are based on very conservative assumptions. The results of these analyses present what DOE considers to be an upper limit of releases to groundwater. After the release of the Record of Decision, characterization of the selected site would determine if additional design features are necessary to stay within the bounding impacts presented in the EIS.

COMMENT CODE

S-5-7

The Department commented on the SNS Notice of Intent by a letter from Mr. Earl C. Leming to Mr. David Wilfert dated August 29, 1997. It was requested in those comments that selection of a “green field” site over a “brown-field” site be addressed and justified in the EIS. It appears this has been done; however, the information is scattered over several sections of the document. Please consolidate the “green field” versus “brown-field” site information under a specific section and list some of the Oak Ridge brownfield sites that were initially considered and explain why those sites were rejected.

RESPONSE

The process of selecting the preferred site for construction of the SNS on the Oak Ridge Reservation was a two phase process. In the first phase, the entire reservation was screened to eliminate areas that were not suitable for construction of the SNS. Brownfield and greenfield areas of the reservation were both included. Areas of land within the ORR with waste area groupings, environmental restoration projects or waste management areas were eliminated from consideration because these areas would require cleanup, with some attendant uncertainty on the extent of cleanup required, prior to excavation for the SNS foundations. This activity could increase worker exposure to radioactive and nonradioactive contaminants and would require the disposal of material removed during clean up in a licensed land fill. This could affect both the budget and schedule of the project. Working in a contaminated area could increase labor costs and disposal costs of the contaminated materials. Coordinating with the Environmental Management program for the cleanup of these areas may resolve the budget issue, however, long schedule delays may result. Coordination of this construction effort with the requirement of RCRA or CERCLA for cleanup of these areas could add a year or more to the construction schedule of the SNS. Siting the SNS in a waste management area could require cleanup of the area, with it associated cost increases and schedule delays, and possibly the relocation of waste management activities. The result of this first phase was the identification of four candidate sites, however, none of these were brownfield sites.

The second phase consisted of a comparative evaluation of the candidate sites using specific site evaluation criteria. One of the Functional Criteria was the avoidance of contaminated soils. One of the Health and Safety criteria was avoiding existing hazardous materials areas and waste areas (i.e. Waste Area Groups and RCRA sites). Again, these criteria were included to avoid the increased risk to construction workers and the increased costs and schedule delays associated with placing a large scale construction project at a site with contaminated soils or hazardous materials.

LOCATION OF EIS REVISION(S): Sections S 1.4.2 and 3.2.4.2

COMMENT CODE

S-5-8

From a groundwater perspective, if this facility were located in Melton Valley over the relatively tight clastic formations such as the Pumpkin Shale, rather than over the Knox Aquifer (the Knox Aquifer is the best source of usable groundwater in E. Tennessee), there would be less risk of groundwater contamination. Further the relatively tight shales under Melton Valley, would offer an advantage from a standpoint of contaminant travel times, absorption, and matrix diffusion compared to the conduit flow that exists beneath Chestnut Ridge.

RESPONSE

The selection of the Chestnut Ridge site for construction of the SNS at ORNL is discussed in Appendix B of the DEIS. Two of the alternative sites on ORNL were located in the vicinity of Melton Valley (Alternatives 1 and 2) but were not selected because they did not meet all of the five siting criteria.

Alternative 1, the area south of the High Flux Isotope Reactor, and Alternative 2, the area east of the Health Physics Research Reactor, did not meet the constructibility criterion. The sites have slopes of greater than 25 percent. Utilities, with the exception of electricity, are not nearby and road access to both sites is poor. These sites also do not meet the criterion concerning proximity to historic places. Several areas within close proximity of these sites have historical value.

COMMENT CODE

S-5-9

If Chestnut Ridge remains the preferred site, every effort should be made to reduce impact to the area.

RESPONSE

DOE agrees with this comment. Should the ORNL site be selected, there are design features which could be included in the SNS for the purpose of minimizing potential impacts to Chestnut Ridge and the surrounding area. DOE will prepare a Mitigation Action Plan after publication of the Record of Decision.

COMMENT CODE

S-5-10

In addition, DOE should respond to citizens' concerns about loss of data quality for the long-term ORNL ecological research projects at Walker Branch Watershed by exploring mitigation opportunities.

RESPONSE

The potential effects of the proposed action on NOAA monitoring and ORNL-ESD ecological research projects in the Walker Branch Watershed are assessed in Sections 5.2.8.1.1, 5.2.8.2.1, 5.7.1.8.1, 5.7.1.8.2, and 5.8.1 of the FEIS. If the ORR site is selected for the SNS, DOE is committed to preparation of a formal mitigation action plan to address these effects. In the mitigation action plan, DOE will identify potential mitigation measures and evaluate them for effectiveness. The measures to be evaluated would include heating the proposed SNS with electric heat pumps or heat recovered from the SNS cooling system instead of the currently proposed natural gas boilers. Such measures could mitigate the effects of CO₂ emissions from SNS operations. To further mitigate the effects from CO₂ emissions, DOE would also evaluate the use of electric or ultra-low-emission vehicles to transport workers to the SNS site from remote parking lots. These evaluations would also include relocating the current NOAA/ATDD monitoring tower to a new location less susceptible to CO₂ and water vapor emissions from the proposed SNS or construction of a new tower at this new location. Based on the results of its evaluations, DOE

will select and commit to the implementation of particular mitigation measures in the mitigation action plan. The mitigation action plan will be completed after publication of the Record of Decision and prior to construction of the proposed SNS.

In accordance with 10 CFR 1021.331, DOE will make copies of the mitigation action plan available for public inspection in the DOE reading room in Oak Ridge (refer to Section 1.4 of this FEIS), and copies will also be available upon written request to DOE. In addition, DOE plans on holding public information meetings concerning the SNS project after publication of the Record of Decision and before the beginning of SNS construction. One of these meetings will include an opportunity for public comment on the contents of the mitigation action plan. The time, location, and agenda for such meetings will be announced through the normal public communications practices of DOE-ORO.

LOCATION OF EIS REVISION(S): Sections 1.4.4 and 5.2.8.1.1

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COMMENT CODE

S-5-11

The draft EIS does not acknowledge that there is currently no outlet for Oak Ridge Reservation Low Level Waste.

RESPONSE

The analysis presented in the DEIS indicates that the waste management facilities at ORNL can accommodate the low-level radioactive waste generated by the proposed SNS. It is true that, as of February, 1999, no low-level radioactive waste have been shipped from ORNL; however, there are contracts in place with permitted facilities to accept low-level radioactive waste from ORNL, as generated. The proposed SNS would not begin generating low-level radioactive waste until the year 2006. The EIS has been revised by stating the status of low-level radioactive waste at ORR as discussed under the preferred alternative of the Waste Management Programmatic EIS.

LOCATION OF EIS REVISION(S): Section 5.2.11

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COMMENT CODE

S-5-12

Several topics that were not covered in the Draft EIS should be included in the final document. These include disposal of Cooling Tower Basin Sludge, handling and disposal of the sediments in the Retention Basin, and processing of activated cooling water from the target areas. Also discuss the expected residence lifetime (in the system) of the cooling water.

RESPONSE

The disposal of cooling tower basin sludge and sediments from the retention basin would be in accordance with waste management procedures in effect at the selected site at the time the waste is generated. Treatment and disposal of these wastes would be done in accordance with all applicable laws and regulations in the state where the SNS is constructed.

The analyses included in the DEIS were based on information from the conceptual design of the SNS. Details of the residence time of water in the target cooling system and the treatment of this water should it have to be replaced are not known yet. These analyses would be done as part of the Title I and Title II (preliminary and detailed) design efforts.

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COMMENT CODE

S-5-13

Include detailed facility maps in the final document. These maps should show expected locations of the facility, retention basins, cooling towers, etc.

RESPONSE

The analyses presented in the DEIS are based on the site layout presented in the Conceptual Design Report. The site layout figures in the DEIS have been modified to show reasonable locations of the retention basin. After the selection of the site for the SNS in the Record of Decision, the layout of the proposed SNS would be optimized for the selected site. The specific locations for the retention basin, cooling tower, electrical substation, and other ancillary facilities would be determined during this optimization process.

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COMMENT CODE

S-5-14

Page S-53, Table S 1.5.2-1. Comparison of impacts among alternatives, ORNL Alternative, Low-Level Radioactive Wastes

Although "contracts are in place", there is currently (Jan. 19, 1999) no outlet for Oak Ridge Reservation Low level Waste.

RESPONSE

The analysis presented in the DEIS indicates that the waste management facilities at ORNL can accommodate the low-level radioactive waste generated by the proposed SNS. It is true that, as of February, 1999, no low-level radioactive waste have been shipped from ORNL; however, there are contracts in place with permitted facilities to accept low-level radioactive waste from ORNL, as generated. The proposed SNS would not begin generating low-level radioactive waste until the year 2006. The FEIS has been revised by stating the status of low-level radioactive waste at ORR as discussed under Preferred Alternatives of the Waste Management Programmatic EIS.

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COMMENT CODE

S-5-15

Page 3-47, Table 3.5-1. Comparisons of impacts among alternatives, ORNL Alternatives

What does "(4%) in radionuclide flux over White Oak Dam" mean? Describe this in terms of an increase in radiological activity in addition to a percentage increase.

RESPONSE

The flux refers to the amount of radioactivity that would be expected to pass over White Oak Dam per period of time. It is the product of activity and flow rate. The 4 percent increase would represent an increase in the total amount of radioactivity (curies) over the dam because of increased flow but not due to an increase in the activity within the water medium.

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COMMENT CODE

S-5-16

Page 4-1, Section 4.1.1, Geology and Soils

This section of the Draft EIS does not discuss the transport of radiological contamination through the soils. Page 9-3 of the Conceptual Design Report NSNS/CDR-2/V2 states in the third paragraph: "A

study of soil groundwater transport and migration of various radionuclides at the preferred NSNS (SNS) site must be performed as part of the EIS in order to determine if the indicated soil concentrations are capable of imparting a radiologically significant component to the groundwater.” Please include this study in the Final SNS EIS.

RESPONSE

A discussion of transport of radionuclides for each of the four alternative sites is presented in Chapter 5 of the DEIS (Sections 5.2.2.3, 5.3.2.3, 5.4.2.3, and 5.5.2.3). Because of the uncertainties in the amount of soil activation products and uncertainties about the groundwater at each of the four sites, these analyses are based on very conservative assumptions. The results of these analyses present what DOE considers to be an upper limit of releases to groundwater. After the release of the Record of Decision, characterization of the selected site would determine if additional design features are necessary to achieve the groundwater protection levels presented in the EIS.

COMMENT CODE

S-5-17

Page 4-7, Section 4.1.1.4, Site Stability

The discussion of soils states that the soils “are not susceptible to liquefaction or mass movement.” This section does not discuss karst sinkhole development which is an active process on Chestnut Ridge. There is a small depression within the footprint of the facility. Please discuss the implications on groundwater, surface water and structural stability following the discovery of karst landforms and how will karst be dealt with during design, construction, and operation of the facility.

RESPONSE

Soil liquefaction and mass movement of soils would only occur in a karst environment if there were a catastrophic failure of the bedrock, as caused by a large void. If ORNL is chosen as the site for the proposed SNS in the Record of Decision, comprehensive site investigation would determine if significant karst development occurs under the Chestnut Ridge site. If this is shown to be the case, specific facilities would be located to avoid these karst areas and the foundations would be designed to mitigate the potential effects of the karst formation.

COMMENT CODE

S-5-18

Page 5-17, 5.2.1.1, Site Stability

Consideration should be made to the active doline formation encountered in the two barrow areas that exits along strike with the proposed SNS site. The two barrow areas suggest that anthropogenic factors can drastically increase the rate of sinkhole formation on Chestnut Ridge. Please discuss the implications of the above in the final document.

RESPONSE

Site characterization studies of the SNS site selected in the Record of Decision would discover active sinkholes. DOE agrees that anthropogenic factors can increase the rate of sinkhole formation; however, there are cost effective engineering methods available to mitigate such circumstances. After the Record of Decision, DOE would complete an optimization study at the selected site. This study would determine the optimal layout of facilities at the site. This would include avoiding sinkholes.

LOCATION OF EIS REVISION(S): Section 5.2.1.1

COMMENT CODE

S-5-19

Page 5-18, Section 5.2.1.2, Seismic Risk, 5.2.1.2-1 Seismic design criteria for ORR

The discussion says Table 5.2.1.2-1 will present “estimated peak ground acceleration (PGA) at locations with greater than 30 ft (10m) of soil cover...,” but the table presents “soil >10 ft (3m).”

RESPONSE

The table heading has been revised. The table does present “estimated peak ground acceleration (PGA) at locations with greater than 30 ft (10m) of soil cover...”.

LOCATION OF EIS REVISION(S): Section 5.2.1.2 and Table 5.2.1.2-1

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COMMENT CODE

S-5-20

Page 5-22 Section 5.2.2.3.1 Resources

Describe the “appropriate measures” if a karst formation is encountered during site characterization at the location of the retention pond.

RESPONSE

The final location of the retention basin has not been determined yet. If the ORNL site is selected in the Record of Decision for construction of the SNS, the Chestnut Ridge site will undergo an extensive characterization to provide detailed information necessary for Title I and Title II (preliminary and detailed) design. A site optimization study would also be completed to identify the optimal layout of the SNS facilities including the retention basin. If problematic karst features are discovered, the optimal site layout may avoid these features. If the retention basin cannot be placed in an area that avoids karst formation, the appropriate engineering solutions, such as grouting, would be implemented.

LOCATION OF EIS REVISION(S): Section 5.2.2.3.1

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COMMENT CODE

S-5-21

Page 5-22 through 5-24, 5.2.2.3, Groundwater

There is a closed depression shown on the S-19-A Oak Ridge Area Map, located within the map south and east area shown as the footprint of the proposed SNS facility. There is also a closed depression shown on the above referenced map to the east of the proposed facility. In all probability these closed depressions represent dolines. The East End barrow area, opened up with numerous swallets, suggests that the West End barrow area may have similar sinkhole development. These two areas are on strike with the proposed SNS facility. This suggests that the Knox Group beneath the site is an active karst aquifer with conduit flow. Dye traces conducted by TDEC demonstrates travel times in the order of 2 cm/sec, not the 2.9 m/yr. ground water velocity provided in this document.

RESPONSE

The groundwater travel times were based on the best available information at the time the EIS was developed. Detailed site specific characterization of the site selected in the Record of Decision would include further groundwater investigation.

The transport rates quoted in the DEIS for the Chestnut Ridge site represent groundwater travel through the upper soil horizon, assumed but unlikely to be under continuously saturated conditions, not through the carbonate bedrock. The engineered berm that would cover the linear accelerator and accumulator rings would be constructed of compacted native soils. The berm would be engineered to isolate activation products by minimizing the amount of water infiltrating the berm.

LOCATION OF EIS REVISION(S): Sections 5.2.1.1 and 5.2.2.3.1

COMMENT CODE

S-5-22

A large karst spring SS-5 emerges at the base of Chestnut Ridge just to the map north of the proposed SNS site SS-5 is one of a series of large karst springs located in similar geologic situations at the base of Chestnut Ridge. A tracer study to determine travel times from this site utilizing potential karst features on or near the site to various receptors cross strike (SS-5) and along strike should be referenced in the final EIS.

RESPONSE

DOE has not conducted a tracer study at the Chestnut Ridge site. If this site is selected in the Record of Decision for construction of the SNS, further study of potential karst features and groundwater travel time will be conducted if warranted.

COMMENT CODE

S-5-23

Page 5-24, Table 5.2.2.3.2-1 Estimates of radionuclide concentrations in soils and water surrounding the proposed SNS

Please explain how the list of radionuclides and the quantities in this table were generated. Free release criteria should apply when there are uncontrolled releases to the environment. The quantities shown exceed the NRC Limits.

RESPONSE

This table was originally presented in the following technical memorandum:

Dole, L., 1998, *Preliminary Assessment of the Nuclide Migration from the Activation Zone Around the Proposed Spallation Neutron Source Facility*, ORNL/TM-13665, September, Oak Ridge National Laboratory, Oak Ridge, Tennessee.

This reference has been added to the text of the EIS. There are no specifically applicable regulations for the SNS situation. Therefore, Nuclear Regulatory Commission (NRC) Limits for Uncontrolled Releases (10 CFR 20) were included in Table 5.2.2.3.2-1 as a benchmark for comparative purposes. The assessment in the EIS indicates that an exceedance of drinking water limits for an actual receptor under realistic conditions would be highly unlikely. If, during preliminary design, it is found that the NRC Limits for Uncontrolled Releases would not be met, additional protective measures, such as the capillary break, would be included in the design of the engineered berm for the proposed SNS.

LOCATION OF EIS REVISION(S): Section 5.2.2.3.2

COMMENT CODE

S-5-24

Page 5-24, Section 5.2.2.3.2, Contamination, Last Paragraph

The concept of a barrier to isolate the soil below the tunnel should be added to the design as a matter of course. This will help mitigate most chances of groundwater being affected by percolating surface water. A rainwater cover or protection of some type over all or selected portions merit consideration.

RESPONSE

Section 3.2.2.9 describes the design features of the shielding berm. The design presented shows two groundwater interceptor systems designed to collect any water that may get through the engineered berm. This water would be sampled and if found to contain any radionuclides, treated as low-level radioactive waste. Otherwise, the water would be released to the retention basin.

The need for an additional rainwater cover or additional protection of some type over all or selected portions of the linear accelerator and accumulator rings would be investigated for the site selected for the SNS in the Record of Decision, during preliminary design and site characterization.

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COMMENT CODE

S-5-25

Page 5-31, Section 5.2.5.3, Aquatic Resources

Large volumes of water containing biocides and antiscaling agents are to be discharged from the retention basin into a relatively small creek. There should be further consideration of the effects of the chemicals and flow increase to White Oak Creek. Alternatives should be evaluated.

RESPONSE

The decision on what chemicals would be used for biocides and antiscaling agents in the cooling tower has not been made. This decision depends, to some extent, on which site is selected and details of the design of the cooling towers and retention basin. If the ORNL site is selected in the Record of Decision, water from the retention basin would be discharged to White Oak Creek through a National Pollutant Discharge Elimination System (NPDES) permitted outfall. This water would be piped down Chestnut Ridge, and discharged into White Oak Creek south of Bethel Valley Road. Thus, this outfall would not impact the upper reaches of White Oak Creek.

Details of the design of the outfall have not been completed. For the ORNL site, the State of Tennessee would be involved in the design through the NPDES permitting process. The selection of the actual discharge point, the use of diffusers, and the rate of discharge would be determined with consultation with the State of Tennessee Department of Environment and Conservation.

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COMMENT CODE

S-5-26

Page 5-207, Section 5.9, Short-Term Use and Long-Term Productivity

The Draft EIS mentions design life and decontamination and decommissioning (D&D) plans for the facility but contains insufficient detail. The EIS should also include the estimated costs associated with D&D and a plan for accumulating the finances required for D&D purposes.

RESPONSE

DOE will prepare a decommissioning plan for the SNS at the selected site after release of the Record of Decision and before the start of construction. This plan will include estimates of the amount of scrap and wastes that would be generated during decommissioning of the facility. At present, DOE estimates the

cost of decommissioning the facility to be 150 million dollars (2006 dollars) (Spallation Neutron Source Project Execution Plan; SNS/97-1). DOE has also committed to prepare the appropriate NEPA documentation prior to decommissioning the facility.

Congress does not ordinarily provide funding specifically for the decommissioning of a project at the outset of the projects life. Rather, it provides funding through the annual appropriation process.

The SNS is being designed to operate for 40 years beginning in 2006. DOE estimates that the facility would be producing neutrons for scientific research approximately 75 percent of this time, or 30 years. Thus, 30 years was used in the DEIS to determine the amount of activation products produced. Advances in technology over the next 46 years may allow the life of the facility to be extended beyond 40 years, provided there is a continued need for the facility.

LOCATION OF EIS REVISION(S): Section 1.3.1

COMMENT CODE

S-5-27

Page 6-1 through 6-18, Chapter 6, Permits and Consultations

The Permitting and licensing requirements' section of the Draft EIS does not mention the Nuclear Regulatory Commission (NRC). The EIS should discuss the possibility of a NRC or State of Tennessee radiological permit/license being required for facility startup and /or operation.

RESPONSE

DOE believes that a discussion of the possibility of an NRC or State of Tennessee radiological permit or license being required for startup and operation of the proposed SNS is not within the scope of this EIS because neither NRC nor the state regulates accelerator-produced waste. If, in the future, after publication of the Record of Decision, the NRC and/or state begin to regulate accelerator produced radiological wastes, DOE will develop a plan for compliance with the regulations. DOE would also work with the NRC and state agencies to help develop effective regulations for this type of wastes.

LOCATION OF EIS REVISION(S): Section 6.1.4

COMMENT CODE

S-5-28

Page 6-3, Section 6.1.1, AIR QUALITY

Tennessee has jurisdiction over radiological NESHAPS. Please correct the statement and Table 6.1-1.

RESPONSE

DOE understands that the State of Tennessee has jurisdiction over radiological NESHAPS. The text of the FEIS has been revised to indicate such jurisdiction.

LOCATION OF REVISION(S): Table 6.1-1 and Section 6.1.1

COMMENT CODE

S-5-29

Page D-11, Table 2-1, Protected vertebrate species with potential habitat on the NSNS site, their preferred habitats, and federal or state protection status.

The first and fourth entries under the "Preferred Habitat" column are incomplete.

RESPONSE

The preferred habitat for the sharp-shinned hawk is a mixture of woods and open country. The preferred habitat for the grasshopper sparrow is grassy fields and farmlands. The table in Appendix E has been corrected.

LOCATION OF EIS REVISION(S): Page D-11

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COMMENT CODE

S-5-30

Page D-12, Figure 2-1, Potential habitat areas for T & E animal species within the proposed NSNS site.

The map would be more useful with the inclusion of the approximate locations of pools and sinkholes where threatened and endangered species and species in need of management might occur.

RESPONSE

This figure is from a report by Rosensteel et al., 1997. The complete report was included in the appendix of the EIS because it contains additional details about the biotic resources at the proposed site for the SNS at ORNL. DOE has committed to a three-season survey of the site selected in the Record of Decision for protected species. The approximate locations of pools and sinkholes where threatened and endangered species and species in need of management might occur will be included in this survey.

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COMMENT CODE

S-5-31

Page D-25, Section 3.4.2, Functional Assessment, Wildlife Diversity

There is no mention of fish being a possible inhabitant of wetlands on this site.

RESPONSE

This comment refers to the surveillance survey of wetlands on and in the vicinity of the Chestnut Ridge site at ORNL. This site is one of four alternative sites included in this EIS. Surveillance surveys for wetlands were done at all four sites for the purpose of comparison and selection of the preferred alternative for construction of the SNS. The information included in the EIS was primarily based on information available from existing sources. After the publication of the Record of Decision, additional information about the wetlands at the selected site for the SNS may be necessary to plan for effective minimization and mitigation of potential impacts. DOE would prepare a Mitigation Action Plan explaining how and when mitigation measures would be implemented and how DOE would monitor the mitigation measures over time to ensure their effectiveness. Information about the fish populations in the wetlands at the selected site would be collected at that time.

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COMMENT CODE

S-5-32

Page D-26, Section 4.0, Summary

The second paragraph states "...no habitat suitable for any fish species that have been previously documented on the ORR..." Should this read "Threatened and Endangered fish species" instead?

RESPONSE

DOE agrees with this comment. The following report is included in Appendix E of the DEIS:

Rosensteel B., D. Awl, J. Mitchell, and L. Pounds, 1997. *Ecological Resource Surveys for the Proposed National Spallation Neutron Source Site on the Oak Ridge Reservation: 1. Potential Habitat for Federal and State Listed Animal and Plant Species, 2. Jurisdictional Wetlands*, JAYCOR, April 22.

The paragraph referenced in the comment is concerned with protected species. Inclusion of “threatened and endangered” in this paragraph would help the context of the sentence, however, because this report has already been published in its final form, DOE cannot make this change.

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COMMENT CODE

S-5-33

As addressed in our original comment letter, the current draft EIS fails to provide specific information on health and safety issues, potential radiological releases, proposed mitigation for protection of groundwater, and the location or occurrence of protected and endangered species within the proposed sites. In addition, specific locations of structures including roads, retention basins, cooling towers and the facility are not provided.

DOE has responded that requested information will be provided in studies and other documents after the ROD is issued. Because these items are necessary to fully evaluate the Environmental Impact of this project, we agree, after concurrence with your office, that it would be appropriate for DOE to issue a supplemental EIS in order to reference those studies and documents. This would formalize the commitments the DOE has made in their responses to comments on the Draft EIS. A supplemental EIS should be issued after the ROD but before construction is begun on the SNS project. The supplemental EIS should also include other appropriate environmental information that will not be available until that time.

RESPONSE

The DEIS contains sufficient information from which to determine the environmental impacts of the proposed action on each of the alternatives. The information presented in the EIS 1) is the best currently available given the level of design work allowed to be completed; 2) was corroborated through reconnaissance level surveys at all four locations; and 3) is adequate to support a siting and construction decision among the four alternative locations. The analysis in the EIS is intentionally designed to conservatively anticipate or “bound” all of the foreseeable environmental impacts at each location, not to present details about the site required to actually go forward with construction. Once DOE identifies the selected site in its Record of Decision, the agency will begin detailed design work and prepare additional evaluations, including a three-season survey, detailed archeological survey, geotechnical investigation, building placements, and other reviews. While these studies will substantially expand our information that would call into question the facts or assumptions in the EIS analysis. In the unlikely event that the additional analyses identify significant new information or adverse environmental impacts beyond those identified in this FEIS, the Department would prepare a supplemental EIS.

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COMMENT CODE

S-5-34

Comment Code S-5-1

Although the scope of the EIS is construction and operation of the SNS, decommissioning is an inevitable end result. It would seem prudent to have some type of funding assurance for D&D after the project life has been exceeded.

RESPONSE

Congress does not ordinarily provide funding specifically for the decommissioning of a project at the outset of the project's life. Rather, it provides funding through the annual appropriations process.

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COMMENT CODE

S-5-35

Comment Code S-5-9 & S-5-12

Based upon our current understanding of the processes associated with the SNS, it is highly unlikely that all radiological waste generated by operation of the Facility can be treated or disposed on site. What commitment will the Department make with regard to management of waste which will not meet an Oak Ridge Waste Acceptance Criteria or will in fact be characterized Special Case Waste (meaning it has no disposition alternative?)

It should be noted that commercial Low-Level Waste disposal contracts are for very low concentrations of radionuclides and certainly could not be utilized for disposition of all low-level waste generated for this proposed facility.

RESPONSE

DOE intends to treat radiological waste from the SNS for volumetric reduction or immobilization, and to dispose of it in properly licensed repositories. The extent of treatment would depend upon the treatment capabilities of the host laboratory for each alternative location. In the case of ORNL, SNS-generated waste would be treated in existing facilities along with other similar wastes and be shipped off-site for disposal. Similarly, DOE expects that special case waste would be shipped off-site for ultimate disposal.

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COMMENT CODE

S-6-1

However, I believe that I may have misunderstood statements in the document pertaining to avoidance of cultural resources in areas on the ORNL site that had not been surveyed yet (page 4-38 and page 5-37, for example). I took these statements to mean that all cultural resources identified during the survey would be avoided, but in reviewing the Draft EIS again, I am not sure I understood this correctly.

RESPONSE

Considerable information is available on the cultural resources of the ORR, particularly the historic resources. The text on page 4-38 indicates that the SNS design engineers would establish the routes of the southwest access road and utility corridors to avoid such known resources, if the proposed site at ORNL is selected for implementation of the proposed action. The text on pages 4-38 and 5-37 also indicates that the established areas would be surveyed for cultural resources. If any are identified, an assessment of the potential effects of the proposed action on these resources would be conducted, and any potential effects would be appropriately mitigated. The potential mitigation measures for these effects would be data recovery or avoidance (e.g. choosing another route or fencing a prehistoric site to protect it). DOE would prepare a mitigation action plan to explain how and when mitigation measures would be implemented and how DOE would monitor the mitigation measures over time to ensure their effectiveness. The text of the FEIS has been revised for clarification purposes.

LOCATION OF EIS REVISION(S): Sections 4.1.7 and 5.2.7

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COMMENT CODE

S-6-2

My specific concern is with the site identified as 40RE488, a multicomponent site located in an area that will be affected by road improvements. I understand that the survey does not indicate that this site is eligible for listing on the National Register of Historic Places, even though prehistoric artifacts were found. My concern is that 10 shovel tests in an area covering 262 feet by 67 feet could have missed Native American graves in this area.

If site 40RE488 will not be avoided during road construction, I would request that more extensive tests be done to determine if burials are present in this area. I realize that DOE has fulfilled the requirement to determine if this site contains resources eligible for the NRHP, but I feel that under the circumstances, more tests are warranted. If Indian burials were found before construction began, it would be easier to avoid them, thus saving time and money.

Please let me know if it will be possible for more tests to be done on 40RE488, and please keep me informed of the progress of the SNS project. Thank you for your time.

RESPONSE

Performance of further archaeological investigations at 40RE488 would be contingent upon selection of the ORNL siting alternative for the SNS in the Record of Decision. As indicated in Sections 5.2.7.1 and 5.2.7.8 of the DEIS, a portion of 40RE488 may be destroyed by road construction under the proposed action. Survey data and the results of limited shovel testing at this site indicate that its prehistoric and historic occupational components are not cultural resources eligible for listing on the National Register of Historic Places. However, if road or other SNS-related construction activities cannot avoid destroying all or a portion of 40RE488, DOE would conduct systematic archaeological shovel testing of this site to assure the Tennessee Commission of Indian Affairs that no prehistoric human burials are present. This testing would be conducted prior to the start of road or other SNS-related construction on or in the immediate vicinity of the site. If prehistoric human burials are encountered during the shovel testings, DOE would comply with applicable requirements under the Native American Graves Protection and Repatriation Act (NAGPRA). These would include taking any appropriate measures necessary to protect the human remains and funerary objects, sending notification to the Qualla Cherokee tribe of the discovery, and entering into consultations with the tribe on appropriate treatment and disposition of the remains.

As previously noted, available survey and shovel test data indicate that 40RE488 is not a cultural resource. However, if artifacts or other remains indicative of a prehistoric or historic cultural resource are unexpectedly discovered during systematic shovel testing, DOE would consult with the State Historic Preservation Officer (SHPO) at the Tennessee Historical Commission. In accordance with NHPA, this consultation would seek ways of avoiding or reducing potential effects on the site. As required by the federal regulations in 36 CFR 800.5(e)(1)(iii), the Advisory Council on Historic Preservation and other interested persons would also be afforded an opportunity to participate in these required consultations.

If artifacts or other remains indicative of a prehistoric or historic cultural resource are discovered inadvertently during SNS-related construction activities on 40RE488, construction activities in the immediate vicinity of the site would cease and DOE would perform the foregoing consultation with the SHPO. For purposes of compliance under Section 3(d) of NAGPRA, the inadvertent discovery of human remains and funerary objects (associated and unassociated) would result in the cessation of construction activities, protection of the discovered items, notification of the discovery to the Qualla Cherokee, and consultation with the tribe on appropriate treatment and disposition of the human remains and funerary

objects. The 30-day delay period following certification that notification of the discovery has been received by the tribe would be followed.

This comment response is based on methodological information presented in Sections 5.1.7.1 and 5.1.7.2 of the DEIS. In further response to this comment, the text in these sections has been revised for clarification purposes.

LOCATION OF EIS REVISION(S): Sections 5.1.7.1 and 5.1.7.2

.....
COMMENT CODE

S-7-1

1. LANL has the rights to approximately 1.8 billion gallons of water per year. They currently use 0.5 billion gallons, the surrounding communities use approximately 0.9 billion gallons, and the proposed SNS could use up to 0.7 billion gallons of water per year. Ground water pumping may lower the water table in nearby wells, reduce long term main aquifer productivity, and directly compete with surrounding communities for water. The DEIS did not describe measures to mitigate this impact.

RESPONSE

DOE recognizes that due to the arid climate in the LANL region, aquifer drawdown is a concern. Information reviewed for this EIS revealed that historic water level measurements in the main aquifer wells in the LANL region have indicated water level declines due to pumping and natural discharges exceeding recharge and inflow (DOE-AL 1998). However, the drawdown is not considered to be a major depletion. Mitigation measures to reduce the drawdown of the aquifer, including the possible construction of a dry cooling tower to recycle process water used at the site, can be undertaken if LANL is selected for the proposed SNS. DOE will prepare a mitigation action plan to explain how and when mitigation measures would be implemented and how DOE would monitor the mitigation measures over time to ensure their effectiveness.

Based on the aforementioned historic studies that indicate water declines, some decline in the groundwater level from SNS operations may be inevitable, although the decline is not expected to impact the available municipal water supply. The text of the EIS has been modified to describe potential aquifer drawdown resulting from operation of the proposed SNS as well as mitigation measures that may be undertaken to minimize the drawdown.

LOCATION OF EIS REVISION(S): Sections 5.3.2.3 and 5.11.2

.....
COMMENT CODE

S-7-2

2. The proposed site at TA-70 is an undeveloped area at LANL within 1 to 2 miles of Bandelier National Monument. Large scale development would eliminate existing public use, be highly visible during the day and night, and increase traffic congestion. Over 330,000 people visit the Monument each year. We expect a greater negative impact to monument visitors and local residents than described.

We also expect noise levels and traffic congestion to be greater than described.

RESPONSE

DOE acknowledges and shares the state's concern for the potential effects of the proposed action on visitors to Bandelier National Monument and area residents, especially with respect to recreation, traffic,

and visual resources. However, based on the information reviewed during preparation of the EIS, DOE does not expect greater negative effects than those already stated in the EIS.

COMMENT CODE

S-7-3

3. White Rock was described to be 3 miles from the SNS. Pajarito Acres is a subdivision of White Rock and appears to be within 1.5 miles of the facility. If the Maximum Exposed Individual (MEI) is based on exposure to individuals in White Rock, we expect it to be greater for residents of Pajarito Acres.

RESPONSE

For the SNS DEIS, the MEI is a hypothetical individual that is assumed to live at the LANL site boundary and to eat only foods grown at that location. The dose to such an individual is evaluated in each of the 16 principal compass directions. At LANL, the MEI is located 1.4 miles (2.2 km) northeast of the Target Building Exhaust Stack. This is in the direction of White Rock; however, since residences are not allowed inside the LANL site boundary, this is the closest possible residence in this direction. The dose at Pajarito Acres and White Rock would be less because they are a greater distance from the target Building Exhaust Stack.

The estimates of noise and traffic levels are derived from the number of workers (during construction and operations) that would commute to the site in addition to current workers. We have also included estimates of truck traffic that would make trips to the site during construction and operations. The methodology for this assessment is contained in Section 5.1.10.1.

COMMENT CODE

S-7-4

4. Siting the SNS at TA-70 would require development of extensive utility infrastructures, such as a 60 to 90 MW power source, natural gas lines, steam lines, a water delivery system and access to sanitary waste facilities. The DEIS did not adequately describe the expense or environmental impacts that would occur from these actions.

RESPONSE

The expense of providing additional utility infrastructure at LANL is an issue separate from the environmental impacts, but cost would also be considered by the Secretary as part of the decision to locate the SNS. The purpose of the EIS is to identify and assess the environmental consequences of locating the SNS at the alternate sites. DOE believes it has identified and assessed the environmental issues associated with locating the SNS at LANL. Section 5.3.10.2, Utilities, states that "Although the existing utilities at LANL are extensive, the logistics of using these site services to support the proposed SNS at TA-70 would involve considerable investment in new infrastructure for all services." Section 5.3.10.2.1, Electricity, identifies significant deficiencies with the current power system and states that the current system has inadequate capacity to support the SNS. Section 5.3.10.2.2, Natural Gas, acknowledges that LANL could meet the capacity for natural gas to support the SNS, "However since no existing gas lines or distribution systems are located in the vicinity of the proposed SNS site, an expansion of natural gas infrastructure would be required to serve future needs of the proposed SNS facility." Section 5.3.10.2.3, Water Service, identifies that the current water service cannot meet the demands of the SNS and that "Significant water supply effects would be expected with the implementation of the proposed SNS facility." Section 5.3.10.2.4, Sanitary Waste Treatment, identifies the lack of facilities on the proposed site and gives two alternatives for sewage treatment. In addition, the lack of utilities infrastructure is summarized and compared to the other candidate sites in the Summary

and Chapter 3. The Secretary can compare the environmental impacts on each resource (including utilities) at the four candidate sites. The DEIS acknowledges that extensive new infrastructure would be required for all utilities at LANL, and even with these improvements, the electricity and water supplies would be inadequate to support the SNS project.

COMMENT CODE

S-7-5

5. This document described cooling-tower blowdown discharge of 250 to 350 gpm into TA-70 drainage. It also stated that the water would infiltrate before reaching the Rio Grande. We believe the shallow alluvium, the short distance to the Rio Grande, and existence of Ancho Spring make it possible for water to flow to the Rio Grande. Surface water flows should meet New Mexico Cold Water Fishery Standards.

RESPONSE

Section 3.2.3.6 of the DEIS indicates that between 500 and 700 gpm of water would be required for operation of the cooling towers and that approximately half of this water would be released to the atmosphere, mostly in the form of water vapor. The other half (250-350 gpm) would be released as blowdown to surface water. However, the water would initially be released to the retention basin, where it would reside until the water cools further before being released to the environment. The rate at which the water would be released from the retention basin has not been determined; however, it would likely be less than 250 gpm. The discharge rate from the retention basin could also be altered to prevent large-scale surface water runoff. Accordingly, DOE believes the water would infiltrate before reaching the Rio Grande. If the LANL site is selected in the Record of Decision for construction of the proposed SNS, DOE will ensure that all surface water discharge meets the requirements of the New Mexico Cold Water Fishery Standards. The text of the EIS has been modified to better describe how the cooling tower water would be discharged to the surface.

LOCATION OF EIS REVISION(S): Section 4.2.2.1

COMMENT CODE

S-7-6

6. This document states that waste management facilities at LANL have sufficient capacity to handle the waste volume projected for the period 1998-2030. Therefore, construction and operation of the SNS would have a minimal contribution to cumulative impacts on waste management facilities. However, it also concludes that the existing treatment facilities do not have the capacity to treat all of the low-level waste from the proposed SNS. It correctly states that the low-level waste (with accelerator-produced tritium) would not meet the waste acceptance criteria for the existing treatment facility at TA-50. Therefore, additional facilities that will accept these wastes are required. A new facility at TA-53 is under construction and expansion at TA-54 would be required. These expansions would be for treatment of waste with accelerator-produced tritium and low-level waste disposal. They do not appear to be minimal impacts.

RESPONSE

The facility that is currently under construction (TA-53 RLW) for the treatment of low-level radioactive wastes with accelerator-produced tritium is not a result of the waste management needs that will be generated by the proposed SNS. This facility is being built because of the present need for this type of facility. TA-53 RLW is scheduled to be built whether or not the SNS is built at LANL. The additional waste that the SNS facility may generate will add to the overall waste but will be within the capacity of

this new facility. Therefore, the impact would be minimal. The text of the FEIS has been revised to clarify this impact.

LOCATION OF EIS REVISION(S): Section 5.3.11

COMMENT CODE

S-7-7

7. Air Quality: a) The project is in an area that is currently in attainment for all National Ambient Air Quality Standards (NAAQS). (Incidentally, the reference on Page 5-69 to Table 5.2.3.2-1 should probably be changed to Table 5.3.3.2-1.) Should LANL be chosen as the preferred site, LANL personnel should meet with the Department's Air Quality Bureau permitting personnel prior to construction of the proposed project to determine the appropriate level of air quality permitting for it.

RESPONSE

The text in Section 5.3.3.2 refers the reader back to an earlier table involving natural gas combustion products. The correct focus of this referral is Table 5.2.3.2-1.

If the SNS site at LANL is chosen for implementation of the proposed action, DOE would meet with personnel from the New Mexico Environment Department, Air Quality Bureau, to determine the appropriate level of air quality permitting required for this facility. Such meetings would occur prior to the initiation of construction on the proposed SNS.

COMMENT CODE

S-7-8

b) The DEIS states that the MEI would receive a radiation dose from this project of approximately 2.9 mrem/year. The DEIS does not provide the location of this individual. Currently, LANSCE (a linear accelerator) at LANL provides between 2.9 and 5.0 mrem per year to the current MEI. The report does not state whether the contributions from LANSCE have been considered in the 2.9 mrem present in this report. Communication with LANL personnel indicates that none of the staff responsible for the calculation of dose from airborne radiation were consulted in the development of the report. LANL is a very unique site due to its topography and climate (as opposed to Oak Ridge). If these considerations were not taken into account, the number reported in the DEIS could be significantly off. Concern about this possibility increases when noting the statement in the DEIS that the MEI reported in 1997 by LANL personnel is too large and should be reduced.

RESPONSE

The DEIS states (page 5-82) that the MEI for SNS airborne emissions would receive an estimated dose of 0.47 mrem/yr for operations at 1 MW and 1.8 mrem/yr for operations at 4 MW.

As indicated in the response to Comment S-7-3, the MEI for SNS operations at LANL is a hypothetical individual assumed to live at the LANL site boundary, 1.4 miles (2.2 km) northeast of the SNS Target Building Exhaust Stack.

In the comment, the source of the MEI dose of 2.9 to 5.0 mrem/yr attributed to Los Alamos Neutron Science Center (LANSCE) is unclear. The LANSCE releases short-lived positron emitters that can cause doses above background in the area of the East Gate. These doses are primarily from direct radiation and air immersion. LANSCE is in TA-53, and the East Gate is north-northeast of LANSCE. The proposed SNS location at LANL is in TA-70, south-southeast of TA-53. Only in TA-33 would the SNS site be

further removed from LANSCE. In 1996, the East Gate was the location of the maximum individual dose for off-site locations, and the LANSCE was identified as the principal contribution to dose to the NESHAP MEI from airborne emissions from existing operations, (See pages 50 and 23 of *Environmental Surveillance and Compliance at Los Alamos during 1996*). The location of the NESHAP MEI is not identified in the cited report. The median dose to the maximum individual at the East Gate was 1.4 mrem/yr, and the dose to the NESHAP MEI was 1.93 mrem/yr. Both doses are given on page 5-82 of the DEIS and are described as representative of dose to MEIs from existing LANL operations. LANSCE is obviously an “existing operation.” The total dose to the MEI from the combination of existing airborne emissions and SNS emissions is 2.4 mrem/yr at 1 MW (1.93 mrem/yr existing + 0.47 mrem/yr SNS). This dose is also given on page 5-82 of the DEIS.

DOE designated an individual at each site as a contact for obtaining site-specific information for preparation of the DEIS. The site contacts either furnished the information or directed the preparer to the appropriate technical specialist. At LANL, data used in airborne dispersion calculations were obtained directly from staff in the Air Quality Group or obtained directly from <http://weather.lanl.gov>.

Each of the alternative SNS sites has unique features that influence airborne dispersion and transport of emitted radionuclides and environmental transport of deposited radionuclides. For an EIS, it is desirable to use methods and models that provide a common basis for comparison of impacts of each alternative and for comparison of the impacts of the proposed actions to those of existing activities at each site. These considerations led to use of the models incorporated in the CAP88 and CAP88-PC computer codes (The models and not the codes themselves were used. Section F.4.1 explains the modifications that were necessary to address emissions associated with the mercury target of the SNS. These codes are used routinely at all four SNS alternative sites to demonstrate compliance with NESHAP requirements and do not model complex terrain. Meteorological input data are readily available and were obtained from the designated individuals at each site or from on-line databases maintained by the sites. Because these codes are run routinely at each site, dose estimates for airborne emissions from existing operations at all sites calculated with site-specific meteorological, agricultural, and demographic data and a consistent methodology are also available for each site. Using this approach, airborne dispersion calculations performed for this DEIS consider the unique climate and topography of LANL (and the other sites) to the same extent that they are considered by these sites in their annual demonstration of compliance with NESHAP.

The DEIS does not state that the “MEI reported in 1997 by LANL personnel is too large and should be reduced.” Instead, the DEIS indicates on page 5-82 that, in addition to the calculations required to demonstrate NESHAP compliance, LANL performs “More realistic calculations, based on a combination of environmental measurements and transport modeling . . .” For 1996, it appears from the discussion on page 48 of the LANL surveillance and compliance report that both calculations were based on CAP88 modeling because environmental monitoring data were incomplete. The difference in the calculations appears to be that the NESHAP result is based on all existing LANL emissions, and the more realistic case considers only LANSCE emissions.

.....
COMMENT CODE

S-7-9

c) The DEIS does not address the Tribal Authority Rule (TAR) which is a vague EPA document that may empower the tribes to receive regulatory authority over LANL instead of the state. The new Neutron Source may place the MEI on tribal land, which would give the tribe excellent leverage to receive authority. However, since the location of the MEI was not adequately described nor were data provided

showing that proper meteorological and topographical considerations were taken into account, it is not possible to reach any specific conclusion.

RESPONSE

The MEI is located 7,313 ft (2,229 m) northeast of the SNS Target Building Exhaust Stack at the center of the “hammerhead” on the footprint of the proposed SNS at LANL (see Section 5.3.9.2.1). This location is essentially at the LANL boundary southwest of White Rock, and it is not on tribal land. Therefore, its location would not result in a shift of environmental regulatory authority from the state of New Mexico to a tribal government.

COMMENT CODE

S-7-10

8. If the SNS is located at LANL, locations other than TA-70 should be considered. For example, there is an existing accelerator facility at TA-53. This location appears to have many of the features described as necessary for the SNS.

RESPONSE

The siting of the proposed SNS facility was determined based upon a site-selection process that is presented in Appendix B of the DEIS. The site-selection process included an evaluation of several potential sites within LANL. Based on the site-selection process, TA-70 was a more preferred siting than TA-53.

COMMENT CODE

S-7-11

1. 4.2 Los Alamos National LANL, Page 4-63, paragraph 1, line 11

The Rio Grande is the only permanently flowing river near the project area.

This statement is incorrect. Ancho Canyon contains a perennial reach, which is supplied by Ancho Spring, that normally extends to the Rio Grande from a position about 0.5 miles southeast of the proposed SNS facility site.

2. 4.2.2.1 Surface Water, Page 4-70, paragraph 2, line 1

There are no permanent surface water resources within 0.25 miles (0.44 km) of the proposed SNS facility site.

The statement is true; however, the document should not that approximately 0.5 miles downstream of the proposed facility, a perennial reach exists in Ancho Canyon.

RESPONSE

DOE acknowledges that the Ancho Canyon spring is located approximately 0.5-miles from the proposed SNS site. The statement in the DEIS was meant to identify *major* surface water bodies. The Ancho Canyon spring is a small surface water body. The text of the EIS has been edited to specify that no major surface water bodies are located within 0.25-miles of the proposed SNS facility, but that Ancho Canyon Spring, a smaller surface water body, is located approximately 0.5-miles from the proposed site.

LOCATION OF EIS REVISION(S): Sections 4.2 and 4.2.2.1

COMMENT CODE

S-7-12

3. 4.2.2.1 Surface Water, Page 4-72, paragraph 2, line 13

Los Alamos, Water, and Pajarito canyons/streams originate upstream of LANL facilities.

This statement is not entirely correct. Several perennial streams exist onsite, and they include: 1) a 2-3 mile reach in Sandia Canyon exists as a result of the discharge of treated sanitary-sewage effluent, and heads at Technical Area 3, 2) a 1.5-2.0 mile reach in Canon de Valle that heads at Technical Area 16, and 3) 2-3 mile reach in Pajarito Canyon that heads near Technical Area 22 (Dale, 1998). A more accurate description of the hydrologic setting should be incorporated into the document.

4. 4.2.2.1 Surface Water, Page 4-72, paragraph 2, line 15

Perennial streams in the lower portions of Ancho and Chaquehui Canyons extend to the Rio Grande without being depleted by recharge to the ground.

A more accurate description of the flow conditions in the referenced canyons should be included in the document. Field observations and documentation during 1996, 1997 and 1998 showed that perennial flow in Chaquehui Canyon extended for approximately 300 ft from Spring 9A, and did not reach the Rio Grande. On September 29, 1998, field observations showed that perennial flow Ancho Canyon extended from Ancho Spring to within about 600 ft of the Rio Grande. In other words, these perennial reaches do not always reach the Rio Grande.

RESPONSE

DOE agrees that several perennial streams exist onsite, including reaches in Sandia Canyon, Canyon de Valle, and Pajarito Canyon. Figure 4.3.1.3-1 of the Site-Wide EIS for LANL indicates that perennial flows in Chaquehui Canyon and Ancho Canyon do reach the Rio Grande. However, DOE acknowledges that various climatic conditions may prevent the perennial flow from always reaching the Rio Grande and that at certain times the perennial streams may infiltrate the ground. The text of the EIS has been revised to state that perennial streams within the LANL region do not always reach the Rio Grande.

LOCATION OF EIS REVISION(S): Section 4.2.2.1

COMMENT CODE

S-7-13

5. 4.2.2.2. Flood Potential, Page 4-72, paragraph 1, line 10

The overall flood risk to LANL and facilities at TA-70 is small because of the position of this site on a mesa top.

We agree that the flood risk on the mesa top is minimal. However, the flood risk downstream in Ancho Canyon and the unnamed canyon may be increased due to the additional outfall and runoff from parking lots, roofs, etc., at the site. The increase in runoff may affect the physical conditions and biological communities downstream from the proposed facility.

RESPONSE

DOE agrees that some additional surface water runoff would occur with construction and operation of the proposed SNS. However, storm drains and curbs in the parking lots would capture most of the runoff from parking lots, roofs, and other surface water transporters at the facility. Some of the surface water

runoff would also be directed to the retention basin (see Section 3.2.2.7). Additionally, the LANL site is vast compared to the proposed SNS site, and the LANL site already receives a large amount of surface water runoff. Any additional runoff resulting from the proposed SNS facility would be minor compared to the already existing runoff at the site. Thus, no obvious effects to the physical conditions and biological communities downstream of the proposed facility would be anticipated.

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COMMENT CODE

S-7-14

6. 4.2.2.3 Groundwater, Page 4-73, paragraph 2, line 9

Depth to groundwater, 840 ft (256 m), at TA-70 inferred from a monitoring well adjacent to the site.

To the best of our knowledge there is no regional monitoring well adjacent to the TA-70. DT-9 is the closest well, and it is located approximately 4 miles northwest of the proposed SNS site.

7. 4.2.2.3 Groundwater, Page 4-73, paragraph 2, line 11

The depth to groundwater at the bottom of Ancho Canyon along the southern edge of TA-70 is 600 ft.

The statement may not be correct considering the fact that Ancho Canyon discharges within the canyon bottom.

RESPONSE

DOE agrees that there are no monitoring wells on or adjacent to the proposed SNS site. The depth to groundwater at the proposed site (840 feet) can be inferred by taking the difference between the surface elevation (6,445 feet) of the proposed site and the groundwater contour elevation (approximately 5,605 feet, as referenced in the DEIS and the Site-Wide EIS for LANL) beneath the proposed site. The text of the EIS has been modified to describe how the 840 ft depth to groundwater was inferred.

DOE acknowledges that Ancho Spring in Ancho Canyon is sourced by the main aquifer. Accordingly, the sentence in Section 4.2.2.3 of the EIS stating that “The depth to groundwater at the bottom of Ancho Canyon along the southern edge of TA-70 is 600 ft (183 m)” has been removed.

LOCATION OF EIS REVISION(S): Section 4.2.2.3

.....
COMMENT CODE

S-7-15

8. 4.2.2.3 Groundwater, Page 4-75, paragraph 4, line 14

Background concentrations of radionuclides and trace metals are shown in the Ancho Spring results.

o The text should explain what “background concentrations” were used. To the best of our knowledge, background concentrations for ground water at LANL have not been agreed upon.

o It should be noted that in 1995, the high explosive compounds HMX (4.9 ppb), RDX (23 ppb) and 2,4-DNT (0.18 ppb) were detected in Ancho Spring waters (data from LANL Report: Environmental Surveillance at Los Alamos during 1995), which may indicate that Ancho Spring is not an appropriate background station.

o Contaminants were also found in Ancho Spring at earlier times. From 1951 through 1955 some contaminants were found: nitrate as nitrate (NO₃), 0.2 to 30.0 ppm; phosphate (NO₃), 3.0 to

30 ppm; chloride (Cl), 2.8 to 93 ppm; and Fluoride (F), 0.2 to 3.2 ppm (data from Weir, et al., 1963, USGS report titled "The hydrology and the chemical and radiochemical quality of surface and ground water at Los Alamos, New Mexico, 1949-55").

RESPONSE

DOE acknowledges that background concentrations for groundwater at LANL have not been agreed upon. Table 4.2.2.3-1 in the DEIS is meant to be representative of groundwater quality near the proposed SNS site. Accordingly, the word "background" has been removed from the referenced sentence in the EIS.

DOE also acknowledges that contamination was previously identified in Ancho Spring. However, as mentioned previously, Table 4.2.2.3-1 is meant only to show the water quality levels in the main aquifer at the LANL site and is not meant to compare the values to background levels.

LOCATION OF EIS REVISION(S): Section 4.2.2.3

.....
COMMENT CODE

S-7-16

9. 4.2.2.3 Groundwater, Page 4-75, paragraph 5, line 1

Long-term trends of the water quality in the main aquifer beneath LANL have shown little impact resulting from operations (LANL, 1997d).

The regional-aquifer monitoring system at LANL is probably inadequate to monitor long-term trends (e.g., long-screened intervals, spacing, casing degradation, possible borehole leakage, etc.). Recent data show that the regional aquifer beneath several historical release sites has been impacted by LANL activities.

RESPONSE

The information used by DOE in formulating the referenced statement was obtained from a document entitled *Environmental Surveillance and Compliance at Los Alamos During 1996*. This document was provided to DOE by LANL. Additionally, the shielding design of the proposed SNS would include a crushed limestone interval covered by a geomembrane liner to protect the groundwater, as discussed in Section 5.11.2 of the EIS.

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COMMENT CODE

S-7-17

10. 4.2.5.3 Aquatic Resources, Page 4-85, paragraph 1, line 2

These habitats currently receive NPDES-permitted wastewater discharges from LANL.

This statement is incorrect. A total of three perennial reaches or aquatic habitats at LANL do not receive wastewater effluent: 1) lower Ancho Canyon, 2) Canon De Valle near TA-16, and 3) Pajarito Canyon from TA-9/22 to approximately the mouth of Two-mile Canyon.

RESPONSE

The statement referred to in the comment is incorrect and has been deleted from the text of the EIS.

LOCATION OF EIS REVISION(S): Section 4.2.5.3

COMMENT CODE

S-7-18

11. 4.2.9.1.2 Water, Page 4-108, paragraph 1, line 21

Surface and runoff water results from Ancho Canyon (TA-70) indicate all radionuclides well below the DOE DCGs for public dose, with many reported values below analytical detection limits (Table 4.2.9.1.2-1).

Surface-water data should be compared to more applicable standards such as New Mexico Water Quality Act or the federal Clean Water Act.

RESPONSE

DOE recognizes the standards set forth in the New Mexico Water Quality Act and the federal Clean Water Act. However, these standards deal with general groundwater quality, whereas the DOE derived concentration guides (DCGs) are for public dose from radionuclides. Additionally, the New Mexico Water Quality Act and the federal Clean Water Act standards are developed for a vast number of contaminants, whereas the standards set forth by DOE are more specific to isotopes including radionuclides. Because DOE specializes in these types of isotopes and because the proposed SNS facility would be constructed on DOE property, the standards set by DOE are more applicable to this particular project.

Because of the uncertainties in the amount of soil activation products and uncertainties about groundwater at each of the four sites, DOE's standards are based on very conservative assumptions. After the release of the Record of Decision, characterization of the selected site would determine if additional design features are necessary to achieve the groundwater protection levels presented in the EIS.

COMMENT CODE

S-8-1

In general, the Division of Solid & Hazardous Materials found the Draft Environmental Impact Statement (DEIS) to be technically rigorous, thoroughly researched, and conscientiously presented. There are not subjects related to the radioactivity involved that we believe should be addressed in greater detail, and we were pleased to see the level of attention paid to radioactive emissions, their environmental impacts, and potential accident scenarios involving radioactive materials.

RESPONSE

DOE appreciates the comment.

COMMENT CODE

S-8-2

A comparison using Table S 1.5.2-1 starting on page S-27 shows several reasons why Brookhaven National Laboratory (BNL) should not be the preferred alternative. The BNL alternative has the highest potential for increasing the radionuclide concentrations in groundwater due to soil activation by the linear accelerator (linac). The estimated radiation dose to the maximally exposed individual (page S-45) and the estimated latent cancer fatalities (page S-46) due to the presented accidents scenarios are greater than those for the Oak Ridge National Laboratory (ORNL) and Los Alamos National Laboratory (LANL) alternatives. This leads to the conclusion on page S-62 of Table S1.5.2-1 that the BNL alternative has the "potential for adverse radiological impacts on human health from normal BNL and SNS operations." In

addition, the projected annual amount of low-level radioactive wastes (page S-53) generated by the SNS (16,400 m³/yr) exceeds BNL's total annual capacity (300 m³/yr), which would require additional low-level waste treatment capacity be provided. For all of these reasons, we agree that BNL should not be the preferred alternative.

RESPONSE

DOE appreciates the comment.

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COMMENT CODE

S-8-3

Section 5.8.4 on page 5-205 lists the unavoidable adverse environmental impacts, should the SNS be constructed and operated at BNL. The first impact listed, neutron activation of soils in the berm used to shield the linac tunnel, is our primary concern. Activation of the soil berm, which is approximately 20 feet above the groundwater table, and the high permeability of the soils in which the SNS would be built, will lead to the rapid contamination of groundwater in much greater concentrations than will be experienced at ORNL or LANL. The intentional contamination of groundwater in the Upper Glacial Aquifer on Long Island without any mitigating measures is unacceptable.

RESPONSE

As discussed in Section 5.11 of the DEIS, appropriate mitigation measures would be undertaken to minimize potential impacts to the groundwater at the site. If the site at BNL is selected for the SNS and if during the investigation of this site it is found that soil conditions and groundwater travel times do not agree with the assumptions used in the EIS, the design of the earthen berm would be modified to assure that the severity of the impacts to groundwater in the Upper Glacial Aquifer would not be greater than those expressed in the FEIS.

If the site at BNL is selected for the SNS in the Record of Decision, DOE would investigate appropriate measures to mitigate the potential effects of the proposed action on contamination of groundwater in the Upper Glacial Aquifer on Long Island. The evaluation and selection of appropriate mitigation measures would be documented in the mitigation action plan, which would be issued after publication of the Record of Decision.

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COMMENT CODE

S-8-4

Under the measures described to mitigate the adverse environmental impacts within sections 5.11.4 on page 5-217, the only measure that BNL has not committed to implementing is a multi-layer shielding design to minimize the activation of the berm soils and the subsequent spread of contamination through subsurface soils and groundwater. If the SNS were to be constructed at BNL, the Department of Environmental Conservation would expect BNL's commitment to construction of the additional shielding, or some equivalent measures, in order to offer the greatest protection of the Upper Glacial Aquifer. Without such measures, this Department opposes the siting of the SNS at BNL.

RESPONSE

After publication of the Record of Decision, characterization of the selected site would determine if additional design features are necessary to stay within the bounding impacts presented in the EIS. If the BNL site is selected for the SNS, DOE is committed to preparation of a formal mitigation action plan that would include the multi-layer shielding design to minimize activation of the berm soils. In the mitigation

action plan, DOE will identify potential mitigation measures for the Upper Glacial Aquifer on Long Island and evaluate them for effectiveness.

COMMENT CODE

M-1-1

1. **Site maps.** Different maps in the EIS show different shapes and boundaries for the proposed facility site on the Oak Ridge Reservation (for example, compare the figures on pages 4-20 and 4-27). This is confusing. Please give an explanation for the different site configurations shown on the different maps.

RESPONSE

Figure 4.1.5.2-1 on page 4-20 is a representation of the footprint of the proposed SNS at ORNL. Figures 4.1.5.4-1 (page 4-25) and 4.1.5.4-2 (page 4-27) show an outline of the area that was included in the surveillance surveys for protected species. Figures 4.1.5.4-1 and 4.1.5.4-2 have been modified to include the footprint of the proposed facility.

LOCATION OF EIS REVISION(S): Figures 4.1.5.4-1 and 4.1.5.4-2

COMMENT CODE

M-1-2

2. **Section 4.1:** There is a puzzling absence of reference citations in some subsections of this chapter. For example, the discussions of the bedrock geology and geologic structure of the Oak Ridge Reservation (pages 4-1 to 4-6) surely are not original to this EIS, but there are no citations to the actual source or sources. Among the other sections where supporting references are absent or incomplete are Section 4.1.2.2 (pages 4-12 to 4-13), which cites no references; Section 4.1.5 (pages 4-18 to 4-27), which directs the reader to “the references compiled for this section” for more detail, but cites only two references that are related to only two of the several topics covered; and the discussion of the End-Use Working Group recommendations (page 4-56), which describes the Working Group’s draft recommendations but does not include a reference citation.

In other instances, sources are identified informally, without full citations. For example, the discussion of emissions from non-DOE facilities (beginning at the bottom right on page 4-57) states that information about airborne emissions was “supplied by the facilities,” but it does not name the facilities, give the dates for which the supplied information was valid, give the dates of the communications by which this information was supplied, nor identify the basis or source for the conclusion about the effective cumulative annual dose equivalent from these facilities. Similarly, Section 4.2.5.3 (page 4-18) names “the Forest Compartment Maps for the ORR” as a source, but gives no citation.

In these cited locations and throughout the EIS, please make sure that the final EIS identifies the sources of information relied upon, both to give appropriate credit to the sources and to help readers investigate the various subjects further, if they wish to do so.

RESPONSE

The commenter is correct. Citations have been included in the text of the FEIS to assist the reader with investigating the subject matter in more detail. The reference for the forest compartment maps for ORNL is complete.

LOCATION OF EIS REVISION(S): Section 4.1

COMMENT CODE

M-1-3

3. Page 4-7, last paragraph in first column. It appears that the second sentence should say “The soils tested ranged from clayey sandy silt *with* gravel-sized chert (Unified Soil Classification System-“GC”) to...” (emphasis added to show insertion).

RESPONSE

The commenter’s analysis is correct. The word “with” has been added to the text of the FEIS.

LOCATION OF EIS REVISION(S): Section 4.1.1.4

COMMENT CODE

M-1-4

4. Page 4-30, Table 4.1.6.1-2. The entry for “Lenoir” should be “Lenoir City.”

RESPONSE

The commenter’s analysis is correct. The entry for “Lenoir” in the table has been corrected to read “Lenoir City.”

LOCATION OF EIS REVISION(S): Table 4.1.6.1-2

COMMENT CODE

M-1-5

5. Page 4-31, Section 4.1.6.3.1. No source is identified for the information in the second paragraph of this section. However, data from the State Department of Education at http://www.k-12.state.tn.us/arc/fa_asr/table19.htm (essentially the same source that is cited elsewhere in the Education section) disagree with the numbers presented here. The lowest local funding percentage (30%) is in Loudon County (not Roane County) and the highest local funding percentage is in Oak Ridge (55%), not Knox County. State funding ranges from 38% in Oak Ridge (lower than Knox County’s 43% figure) to 62% in Loudon (not Roane) County.

RESPONSE

The commenter’s analysis is correct. The percentages currently in the DEIS are incorrect. The correct percentages for federal, state, and local funding along with their sources have been included in the text in Section 4.1.6.3.1 of the FEIS.

LOCATION OF EIS REVISION(S): Section 4.1.6.3.1

COMMENT CODE

M-1-6

6. Page 4-32, Table 4.1.6.3.1-1. This table of public school statistics sometimes omits city-operated school systems and sometimes lumps them in with the counties. Cities in the region that operate separate school systems are Oak Ridge, Clinton, Harriman, and Lenoir City. Based on comparison with the cited source (which gives data for the city and county systems separately), it appears that the table includes data for Oak Ridge and Clinton in some of the measures for Anderson County (e.g., the number of schools) but not others (e.g., student enrollment and per-pupil expenditures), while data for Lenoir City and Harriman seem to be completely missing. Please revise this table to include data for the city school systems. It is misleading to combine the data for city and county systems, since measures such as per-pupil expenditures can differ significantly between different systems in the same county (for example,

Appendix A

Oak Ridge spent \$6,794 per pupil, while Anderson County spent \$4,900). Also, please check all the figures in the table for accuracy (some of them do not match any of the data in the source).

RESPONSE

The commenter's analysis is correct. An updated table is included in the FEIS to show the city operated school systems.

LOCATION OF EIS REVISION(S): Table 4.1.6.3.1-1

COMMENT CODE

M-1-7

7. Page 4-32, first paragraph. The City of Oak Ridge Fire Department does serve the Oak Ridge community, but it is not the primary source of fire protection for ORNL. ORNL operates its own separate fire department, although there is a mutual aid agreement with the City. Please obtain the correct information from ORNL or from DOE Oak Ridge Operations and revise this passage accordingly.

RESPONSE

The commenter's analysis is correct, the Oak Ridge Fire Department is not the primary source of fire protection for ORNL. The last sentence, "The Oak Ridge Fire Department provides fire suppression, medical/rescue, wildland fire suppression, and fire prevention services to both ORNL and the Oak Ridge community," will be deleted and replaced with the following: "Fire protection for ORNL is provided on site by the ORNL Fire Department. The ORNL Fire Department has 30 firefighters and operates one rescue vehicle, two pumper engines, and two ambulances. The ORNL Fire Department has mutual agreements with the Y-12 Fire Department, the East Tennessee Technology Park (ETTP) Fire Department, and the Oak Ridge Fire Department (Rosenbalm, 1999)."

LOCATION OF EIS REVISION(S): Section 4.1.6.3.3

COMMENT CODE

M-1-8

8. Pages 4-35 to 4-40, Section 4.1.7. This Cultural Resources section mentions several properties on the Oak Ridge Reservation as being "eligible" for National Register listing, but does not mention the properties that are listed on the National Register of Historic Places, nor indicate that the Oak Ridge Graphite Reactor is a National Historic Landmark. Please include this information.

RESPONSE

No prehistoric sites on the ORR are listed on the National Register of Historic Places (NRHP). However, seven historic sites on the ORR are listed on the NRHP. The text of the DEIS has been revised to include this information and the names of the listed sites.

LOCATION OF EIS REVISION(S): Section 4.1.7

COMMENT CODE

M-1-9

9. Page 4-41, first paragraph in second column. The north corner of the original reservation was never "politically separated from the reservation and incorporated as the City of Oak Ridge." From the City's inception, the corporate boundaries of the City of Oak Ridge have included the entire reservation area.

RESPONSE

The sentence, “In the late 1950s, this area was politically separated from the reservation and was incorporated as the city of Oak Ridge” has been removed.

LOCATION OF EIS REVISION(S): Section 4.1.8.1

.....
COMMENT CODE

M-1-10

10. Page 5-22, Section 5.2.2.3.1. Regional construction experience indicates that infiltration from retention basins built over the Knox Group can sometimes accelerate karst processes and lead to formation of sinkholes, even when no preexisting sinkhole features have been identified. Therefore, DOE should consider constructing the retention basin in a manner that prevents or minimizes infiltration of collected runoff.

RESPONSE

DOE agrees that infiltration from retention basins can sometimes accelerate karst processes and lead to the formation of sinkholes, even when no preexisting sinkhole features have been identified. After the publication of the Record of Decision, DOE would complete an optimization study at the selected site. This study would determine the optimal layout of facilities at the site, including the retention basin. DOE will include consideration of engineering the retention basin to minimize infiltration.

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COMMENT CODE

M-1-11

11. Page 5-22, last paragraph. It is not conservative to assume that the hydraulic conductivity of the vadose zone is equal to the saturated hydraulic conductivity of the soil matrix in the saturated zone. There is an extensive body of evidence (including research observations on the Walker Branch Watershed, published in ORNL reports and the open literature by researchers including Robert Luxmoore, Glenn Wilson, and Philip Jardine) demonstrating that most vadose zone flow is in “macropores,” including fractures and root channels, not in the soil matrix. As a result, transit time through a 10-m distance in the vadose zone could be measured in minutes or hours, not years. Please use Walker Branch research results as a basis for revising the analysis of groundwater contamination impacts to include a more realistic assessment of radionuclide transport in the vadose zone.

RESPONSE

DOE is familiar with the Walker Branch Watershed research cited by the commenter. However, the macropore flow would not be appropriate to calculated travel time. The transport rates quoted in the DEIS for the Chestnut Ridge site represent groundwater travel through the upper soil horizon (assumed but unlikely to be under continuously saturated conditions). The soil removed during excavation of the site for construction of the tunnels for the linear accelerator and accumulator rings would be stored on-site and would later be used to construct the earthen berm. The engineered earthen berm that would cover the linear accelerator and accumulator rings would be constructed of compacted native soils, thus eliminating macropore flow of groundwater. The berm would be engineered to isolate activation products by minimizing the amount of water infiltrating the berm.

.....
COMMENT CODE

M-1-12

12. B-34, Table. This table indicates that the Clinch River Breeder Reactor Site is currently used for waste management. As we understand it, the site is vacant and available for industrial development. Please check the information and correct table.

RESPONSE

The land use designation for the Clinch River Breeder Reactor Site has been changed from “waste management” to the correct designation of “industrial.”

LOCATION OF EIS REVISION(S): Appendix B, Table 2**COMMENT CODE**

M-2-1

You may recall that in April of 1997, you received a copy of a resolution adopted by the Oak Ridge City Council (Resolution No. 4-61-97) supporting and endorsing the National Spallation Neutron Source (SNS) and the companion Joint Institute for Neutron Science (JINS). The resolution was accompanied by a letter enlisting your support for these projects. I am once again enlisting your support as a fellow Tennessean.

Enclosed is a copy of Resolution No. 2-14-99 which was unanimously adopted by the Oak Ridge City Council during its regular meeting on Monday, February 1, 1999. This resolution reinforces our strong support for the Spallation Neutron Source (SNS) and urges its construction and operation at the preferred site in Oak Ridge. As explained in the resolution, the Department of Energy (DOE) has identified four alternative sites for the SNS: Oak Ridge National Laboratory (ORNL), Argonne National Laboratory in Illinois, Brookhaven National Laboratory in New York, and Los Alamos National Laboratory in New Mexico. We want to ensure that this project which will benefit not only Oak Ridge but our entire state, both economically and prestigiously, is located on the ORNL site. I am enclosing a publication titled, “Spallation Neutron Source, the Next-Generation Neutron Scattering Facility for the United States,” that I believe you will find helpful in understanding the scope of this project and the opportunities it offers for future scientific and industrial research and development.

Any action you may take at this time to demonstrate your support for the location of the SNS at ORNL will be helpful. I cannot state too strongly that the completion of this project, and the companion JINS, will be in the long-term best interests of our state and our country. Please feel free to call me if you have questions or would like additional information about these projects.

RESPONSE

DOE appreciates the comment.

COMMENT CODE

M-3-1

The CAP strongly supports the selection of the Preferred Alternative to locate the SNS in Oak Ridge and have it be operated by ORNL. We recognize the importance of the research enabled by the SNS. The following comments are given for the purpose of strengthening the document and support for SNS.

The CAP reiterates its strong support for locating the SNS at the Oak Ridge Reservation.

RESPONSE

DOE appreciates the comment.

COMMENT CODE

M-3-2

The draft EIS documents most of the concerns and issues raised at the scoping meeting except for one—the lack of public involvement in selecting the actual, physical site. The draft EIS and associated public meetings are the first opportunity to comment on the proposed physical site. Allowing public involvement earlier in the site screening process for the ORR would have been desirable.

RESPONSE

The siting of the proposed SNS facility was determined based upon a site selection process that is presented in Appendix B of the DEIS. The site selection process included an evaluation of several potential sites within the ORR.

DOE has held additional public information/comment meetings concerning the SNS project, and will continue to do so. The time, location, and agenda for these meetings will be announced through normal public communication processes at the site selected in the Record of Decision. Input and comments from the public will be considered by DOE in its decisionmaking processes, as exemplified by this EIS.

COMMENT CODE

M-3-3

1. The site plan shown on page 3-12 and elsewhere does not show the retention basin for site runoff, sediment settling, and cooling tower blowdown. This basin is discussed on pages 5-20, 5-21, 5-30, and elsewhere, but its size and location are never given. The retention basin could significantly increase the footprint of the SNS on the ridgetop.

RESPONSE

The retention basin is not shown on the site plan (Figure 3.2.1.5-1) on page 3-12 because the figure is meant to show a generic site plan illustrating the facility. The placement of a retention basin is site specific and will vary in location according to the site. The figures showing the specific SNS site location for each of the four alternative locations have been modified to include the retention basin. The text of the EIS concerning the retention basin has also been clarified. At the Conceptual Design stage of the project, the size of the retention basin required was estimated as approximately 2 acres.

LOCATION OF EIS REVISION(S): Figures 4.1-1, 4.2-1, 4.3-1, and 4.4-1; Sections 3.2.2.3, 3.2.3.6, 5.2.2.1.2, 5.2.5.2, 5.3.2.1, 5.3.5.2, 5.4.2.1, 5.4.5.3, 5.5.2.1, 5.5.5.2, 5.8.1, 5.8.2, 5.8.3, 5.8.4, 5.11.1, and 5.11.3

COMMENT CODE

M-3-4

2. Page 5-37, last paragraph mentions construction or improvement of utility corridors and a southwest access road not assessed at the time of the Draft EIS. Mitigation measures should be planned and implemented for impacts in addition to those on cultural resources, for example if any of the corridors run through the buffer zone for Walker Branch watershed.

RESPONSE

The CEQ regulations (40 CFR 1501.2) require integration of the NEPA process with other planning for proposed actions “...at the earliest possible time...” In the DOE system, this means that an EIS is

typically initiated during the Conceptual Design phase of a project. At this most general level of design, enough is known about a proposed action to allow the preparation of an EIS. However, the full details of a proposed action may not be established until the completion of Title I and Title II (preliminary and detailed) design at a later date.

This EIS was initiated during the Conceptual Design phase of the SNS project. Title I and Title II design for the project have not been completed. As a result, all of the final design details for the proposed SNS have not been established. For example, the final routes of access roads and utility corridors to the proposed SNS sites at the four National Laboratories are not known. In addition, the final locations of the retention basin are uncertain. Consequently, the potential effects of construction and operational activities on the environment for these specific items cannot be reasonably assessed at this time.

If a final site for the proposed SNS is selected, the locations of the retention basin, roads, and utility corridors would be established at the host national laboratory. To the maximum extent possible, these locations would be delineated to avoid known environmental features such as cultural resources, wetlands, and natural areas. In addition, the potential effects of the proposed action on the overall environment in these areas would be assessed. If effects would result, DOE would identify, evaluate, and commit to appropriate mitigation measures in the Mitigation Action Plan. These measures would be implemented prior to the initiation of ground-disturbing activities in the delineated areas.

The basis elements of the foregoing strategy are presented in the introduction to Chapter 5 of the DEIS. The test of the introduction has been revised to clarify the role of the mitigation action plan in this strategy.

LOCATION OF EIS REVISION(S): Chapter 5 (Introduction)

.....
COMMENT CODE

M-3-5

The Draft EIS does not effectively show the intrusion of the SNS into environmentally sensitive areas. In contrast, the CERCLA Waste Disposal RI/FS (DOE/OR/02-1637&D2 in Figures 7.2, 7.3 and 7.4) shows in detail the sensitive areas. The CAP referred to these figures in studying the proposed SNS site, as they better show the sensitive areas' proximity to the SNS preferred location. For example, a copy of Figure 7.4 is enclosed; the inclusion of a similar figure in Section 4.1.5 or 5.2.5.4 along with the figure found on page B-43 is recommended.

RESPONSE

An additional figure showing environmentally sensitive areas on and adjacent to the proposed SNS site at ORNL has been included in the FEIS. The other figure mentioned by the commenter is considered to already be part of the EIS (Volume II, Appendix B, page B-43). This figure shows biodiversity significance ranking (BSR) areas relative to the proposed SNS site on the ORR. A new paragraph referring the reader to these figures has been included in the text of the FEIS.

LOCATION OF EIS REVISION(S): Section 4.1.5.4, Figure 4.1.5.4-2 (new)

.....
COMMENT CODE

M-3-6

In addition, an outline of the SNS footprint should be shown on Figures. 4.1.5.4-1 and 4.1.5.4-2.

RESPONSE

Figures 4.1.5.4-1 and 4.1.5.4-2 have been revised to include an outline of the SNS footprint.

LOCATION OF EIS REVISION(S): Figures 4.1.5.4-1 and 4.1.5.4-2 (renumbered as Figure 4.1.5.4-3)

COMMENT CODE

M-3-7

Figures 4.1.8.3-1 and 4.1.8.3-2, found on pages 4-54 and 4-55 respectively, are not readable; these maps would be improved by expanding the view of the affected area and choosing lighter shading patterns.

RESPONSE

The base map for Figure 4.1.8.3-1 was originally done in multiple colors. It was translated into a black and white format for use in the DEIS. Prior to issuance of the draft document, several attempts to improve the quality of this figure were undertaken with limited success. However, the relationship of the BSR areas to the proposed SNS site is shown in another figure in the EIS. This figure, which provides an expanded view of the affected area, is in Volume II, Appendix B, page B-43.

An attempt has been made to improve the quality of Figure 4.1.8.3-2, particularly on the legend bars.

LOCATION OF EIS REVISION(S): Figure 4.1.8.3-2

COMMENT CODE

M-3-8

The Draft EIS does a good job of stating the potential impact of the Chestnut Ridge SNS site on the climatic research being done in the Walker Branch watershed in support of the Nations Global Change Program. If this proves to be the chosen site, the CAP would like to see a commitment to mitigation measures before construction begins. Mitigation of the SNS impact on this research is extremely important to protect the value of 30 years of climate data. In addition to replacement of natural gas boilers with electric heat pumps (page 5-41), use of an electric shuttle but to transport people to the site during the operations period is another potential mitigation mechanism. An electric shuttle would not only reduce carbon dioxide emissions from conventional vehicles but would also reduce runoff by eliminating the need for large parking lots, consequently allowing reduction of the volume of the retention basin and of the overall footprint of the SNS complex.

RESPONSE

The potential effects of the proposed action on NOAA monitoring and ORNL-ESD ecological research projects in the Walker Branch Watershed are assessed in Sections 5.2.8.1.1, 5.2.8.2.1, 5.7.1.8.1, 5.7.1.8.2, and 5.8.1 of the FEIS. If the ORR site is selected for the SNS, DOE is committed to preparation of a formal mitigation action plan to address these effects. In the mitigation action plan, DOE will identify potential mitigation measures and evaluate them for effectiveness. The measures to be evaluated would include heating the proposed SNS with electric heat pumps or heat recovered from the SNS cooling system instead of the currently proposed natural gas boilers. Such measures could mitigate the effects of CO₂ emissions from SNS operations. To further mitigate the effects from CO₂ emissions, DOE would also evaluate the use of electric or ultra-low-emission vehicles to transport workers to the SNS site from remote parking lots. These evaluations would also include relocating the current NOAA/ATDD monitoring tower to a new location less susceptible to CO₂ and water vapor emissions from the proposed SNS or construction of a new tower at this new location. Based on the results of its evaluations, DOE will select and commit to the implementation of particular mitigation measures in the mitigation action

plan. The mitigation action plan will be completed after publication of the Record of Decision and prior to construction of the proposed SNS.

In accordance with 10 CFR 1021.331, DOE will make copies of the mitigation action plan available for public inspection in the DOE reading room in Oak Ridge (refer to Section 1.4 of this FEIS), and copies will also be available upon written request to DOE. In addition, DOE plans on holding public information meetings concerning the SNS project after publication of the Record of Decision and before the beginning of SNS construction. One of these meetings will include an opportunity for public comment on the contents of the mitigation action plan. The time, location, and agenda for such meetings will be announced through the normal public communications practices of DOE-ORO.

LOCATION OF EIS REVISION(S): Sections 1.4.4 and 5.2.8.1.1

COMMENT CODE

M-3-9

A better decommissioning plan is needed. Page 5-43 (second paragraph) states: “Current plans call for in-situ decommissioning of the SNS when its operational life cycle is completed.” This is unacceptable to the CAP. Such approaches typically have resulted in excessive releases of contaminants to the environment as well as disproportionate surveillance and maintenance costs.

RESPONSE

DOE will prepare a decommissioning plan after release of the Record of Decision and before the start of construction. DOE has also committed to prepare the appropriate NEPA documentation prior to decommissioning the facility, when decommissioning becomes reasonably foreseeable.

COMMENT CODE

M-3-10

Additionally, 30-years of continuous operations (page 5-19) seems unrealistically short for this type of facility with the likely strong demand for linac time by neutron researchers. In practice, even “temporary” buildings on the ORR are still in use more than 50 years after construction.

RESPONSE

The SNS is being designed to operate for 40 years beginning in 2006. DOE estimates that the facility will be producing neutrons for scientific research approximately 75 percent of this time, or 30 years. Thus, 30 years was used in the DEIS to determine the amount of activation products produced. Advances in design and technology over the next 46 years may allow the life of the facility to be extended past 40 years, provided there is a need for the facility.

LOCATION OF EIS REVISION(S): Section 1.3.1

COMMENT CODE

M-3-11

1. On page 4-5 the figure is mislabeled; it should be 4.1.1.1-3 (as referenced on page 4-7). In addition, the four borings discussed should be identified.

RESPONSE

The incorrect figure number on page 4-5 in the DEIS has been changed to Figure 4.1.1.1-3. The boreholes discussed in Section 4.1.1.4 are B-1, B-5, B-8, and B-11. These boreholes have been identified in the text.

LOCATION OF EIS REVISION(S): Section 4.1.1.1

COMMENT CODE

M-3-12

2. Page 4-19 (second paragraph of second column) states that one wetland area near Bear Creek south tributary 4 (BCST4) will be affected. However Table 4.1.5.2-1 and Figure 4.1.5.2-1 show BCST2.

RESPONSE

The paragraph identified in the comment is not intended to indicate that wetland BCST2 would be affected by the proposed action or the non-action alternative. This paragraph simply identified the wetlands in the vicinity of the proposed SNS site at ORNL. The wording "...Bear Creek south tributary 4..." in the DEIS has been changed to read "Bear Creek south tributary 2..."

LOCATION OF EIS REVISION(S): Section 4.1.5.2

COMMENT CODE

M-3-13

3. On page 5-38 in the first column, 40RE488 is discussed in both the prehistoric and historic resource section, it is not clear whether there are two components to this location or if this is an error.

RESPONSE

Sections 5.2.7.1 and 5.2.7.2 are not in error, but the comment indicates the need for some clarification of the DEIS text. This need for clarification rests on the meaning of the term "component", as it is typically used in American archaeology.

Many archaeological sites contain the separate and distinctive material remains of occupations by different cultural groups. Each of these occupations may be associated with a particular period in time, and the individual occupations may be separated from each other in time by thousands of years. In American archaeology, each culturally and temporally distinctive occupation of a single site is referred to as a component. One archaeological site may have a single component, but another may have numerous components. Sites with more than one component are referred to as multicomponent sites. Site 40RE488 is a multicomponent site. It contains archaeological remains indicative of a prehistoric occupation, and it was also the site of a late 19th or early 20th century Anglo-American occupation. Thus, in the DEIS, potential effects on the prehistoric component at this site are appropriately assessed under Section 5.2.7.1, Prehistoric Resources, and potential effects on the Anglo-American component are appropriately assessed under Section 5.2.7.2, Historic Resources.

The text of the DEIS has been revised to more clearly indicate that 40RE488 has both a prehistoric component and a historic component. This includes the insertion of an explanatory text box in Chapter 5.

LOCATION OF EIS REVISION(S): Sections 4.1.7.1, 4.1.7.2, 5.2.7.1, and 5.2.7.2 (new text box)

COMMENT CODE

M-3-14

4. On page 5-48 in the second paragraph of the second column the figures for annual dose to members of the public appear to be reversed for inside and outside the controlled area.

RESPONSE

The dose limits are correct as stated. The SNS shielding policy is based on the requirements of 10 CFR 835 and is intended to simplify radiation monitoring of individuals at the facility. The dose to members of the public is limited to 100 mrem/yr both inside and outside the controlled area; however, 10 CFR 835.402(a)(3) and 835.402(c)(3) require individual radiation monitoring for minors and members of the public inside the controlled area that would be likely to receive external or internal exposures of 50 percent of the annual limit. By limiting potential exposure to such individuals to no more than 50 mrem/yr, the SNS shielding policy eliminates the need to issue individual radiation monitors to visitors. Such monitors are not required for individuals outside the controlled area.

COMMENT CODE

M-3-15

5. Table 2.1 in Appendix B should be inverted, currently much of the information is upside down.

RESPONSE

Table 2.1 in Appendix B has been oriented so that the information in the table is right side up.

LOCATION OF EIS REVISION(S): Table 2.1 in Appendix B

COMMENT CODE

M-3-16

6. Figures 1 and 2, respectively on pages B-27 and B-29, are unreadable.

RESPONSE

Figures 1 and 2 in Appendix B of the DEIS are part of a separate report on selection of the proposed site for the SNS at ORNL. The full text of this report is included in the EIS to document how this site was selected. In the original report, Figures 1 and 2 are highly complex color maps with subtle gradations in color from one area to another. Such maps are not very amenable to the reproduction of detail in the black and white format chosen for this EIS. Nonetheless, DOE believes it is necessary to include this report in the EIS. The color versions of these maps are available for public inspection and use in the DOE Reading Rooms. The locations of the reading rooms are provided in Volume 1, Section 1.5, page 1-17 of the EIS.

COMMENT CODE

M-4-1

As the Loudon County Executive, I want to express my support for the Spallation Neutron Source. Because of the positive impact it will have in our region and, more importantly, our nation.

The Spallation Neutron Source is important to the future of the United States as our nation seeks to maintain its technological and research supremacy in the 21st Century global economy.

Researchers from industry and universities from around the country will come to Oak Ridge to the SNS's research capabilities. Industry partners will create new materials that will produce jobs and promote economic growth.

It is in support of this larger national endeavor that I endorse construction of the SNS in Oak Ridge.

RESPONSE

DOE appreciates the comment.

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COMMENT CODE

M-5-1

As Knox County Executive, I am pleased to take this opportunity to express my support for the Spallation Neutron Source. It will have a positive impact in our region, and more importantly, our nation.

RESPONSE

DOE appreciates the comment.

.....
COMMENT CODE

M-6-1

As Mayor of Knoxville, I want to express my support for the Spallation Neutron Source because of the positive impact it will have in our region and, more importantly, our nation.

RESPONSE

DOE appreciates the comment.

.....
COMMENT CODE

M-7-1

As the Roane County Executive, I want to express my support for the Spallation Neutron Source because of the positive impact it will have in our region and, more importantly, our nation.

RESPONSE

DOE appreciates the comment.

.....
COMMENT CODE

M-8-1

As the Blount County Executive, I want to express my support for the Spallation Neutron Source because of the positive impact it will have in our region and, more importantly, our nation.

It is in support of this larger national endeavor that I endorse construction of the SNS in Oak Ridge.

RESPONSE

DOE appreciates the comment.

COMMENT CODE

O-1-1

I fully support the SNS at the Oak Ridge Reservation.

RESPONSE

DOE appreciates the comment.

COMMENT CODE

O-1-2

1. I disagree with the decision to select the site without public involvement. The preferred site may actually be the best one, but the location being in the buffer area of Walker Branch does raise some questions. This long term research area will be impacted.

RESPONSE

The selection of the Chestnut Ridge site for construction of the SNS at ORNL is documented in the engineering study presented in Appendix B of the DEIS. The study shows how the entire reservation was assessed, using exclusionary criteria, to identify the Chestnut Ridge site as the best alternative.

The potential effects of the proposed action on NOAA monitoring and ORNL-ESD ecological research projects in the Walker Branch Watershed are assessed in Sections 5.2.8.1.1, 5.2.8.2.1, 5.7.1.8.1, 5.7.1.8.2, and 5.8.1 of the FEIS. If the ORR site is selected for the SNS, DOE is committed to preparation of a formal mitigation action plan to address these effects. In the mitigation action plan, DOE will identify potential mitigation measures and evaluate them for effectiveness. The measures to be evaluated would include heating the proposed SNS with electric heat pumps or heat recovered from the SNS cooling system instead of the currently proposed natural gas boilers. Such measures could mitigate the effects of CO₂ emissions from SNS operations. To further mitigate the effects from CO₂ emissions, DOE would also evaluate the use of electric or ultra-low-emission vehicles to transport workers to the SNS site from remote parking lots. These evaluations would also include relocating the current NOAA/ATDD monitoring tower to a new location less susceptible to CO₂ and water vapor emissions from the proposed SNS or construction of a new tower at this new location. Based on the results of its evaluations, DOE will select and commit to the implementation of particular mitigation measures in the mitigation action plan. The mitigation action plan will be completed after publication of the Record of Decision and prior to construction of the proposed SNS.

In accordance with 10 CFR 1021.331, DOE will make copies of the mitigation action plan available for public inspection in the DOE reading room in Oak Ridge (refer to Section 1.4 of this FEIS), and copies will also be available upon written request to DOE. In addition, DOE plans on holding public information meetings concerning the SNS project after publication of the Record of Decision and before the beginning of SNS construction. One of these meetings will include an opportunity for public comment on the contents of the mitigation action plan. The time, location, and agenda for such meetings will be announced through the normal public communications practices of DOE-ORO.

LOCATION OF EIS REVISION(S): Sections 1.4.4 and 5.2.8.1.1

COMMENT CODE

O-1-3

2. Better maps are required in the Final EIS. Figure S 1.3.1-1 showing the proposed SNS site on the ORR is cursory to say the least. A similar overview is fine, but a more detailed map of the site showing Walker Branch, the buffer area, relationship to EM areas in Bear Creek Valley, and any other ORR features (roads, utilities, etc.) is necessary.

RESPONSE

The introduction to Section S 1.3 states that the descriptions within it are designed to provide a brief look at each alternative site without providing a comprehensive level of detail, which would be beyond the reasonable scope of the Summary. In keeping with this statement, Figure S 1.3.1-1 was included only to show the location of the proposed SNS site on the ORR.

The level of map detail requested in the comment appears to be comprehensive in nature. Such detail would be difficult to put in a single black-and-white map suitable for a Summary without compromising legibility and ease of use. However, the additional details requested in the comment may be found on several different maps in the main text of the EIS and its appendices. These include Figure 4.1.8.2-2 (Walker Branch Watershed and its buffer zone), Figure 4.1.10.1-1 (vehicular transportation routes), Figure 5.7.1-1 [proposed locations for the Comprehensive Environmental Response and Liability Act (CERCLA) Waste Disposal Facility in Bear Creek Valley], and Appendix B, Exhibit 1 maps (utilities, historic sites, and BSR areas).

COMMENT CODE

O-1-4

3. The sense of the noun mitigation is “to act in such a way as to cause an offense to seem less serious.” It is used in monitoring, wetlands, and maybe other places. As Ms. Barbara Walton pointed out, there is no commitment to mitigation measures. Please consider this very seriously. We do not want the more colloquial definition to be used: “If the good lord is willing and the creeks don’t rise.”

RESPONSE

Section 1508.20 of the Regulations for Implementing the Procedural Provisions of the NEPA (40 CFR 1500-1508) defines “mitigation” to include: (a) avoiding the impact altogether by not taking a certain action or parts of an action; (b) minimizing impacts by limiting the degree of magnitude of the action and its implementation; (c) rectifying the impact by repairing, rehabilitating, or restoring the affected environment; (d) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and (e) compensating for the impact by replacing or providing substitute resources or environments.

DOE has committed to numerous design specifications in the DEIS that avoid or minimize impacts to the affected environment. In some cases, like the potential impacts to the Walker Branch Watershed research area, DOE does agree that the DEIS presents potential mitigation measures but does not specify which mitigation measure would be implemented because, until the site is selected, specific mitigation cannot be determined. The Record of Decision will include a discussion of the mitigation measures at the selected site. In addition, DOE will prepare a Mitigation Action Plan to explain how and when mitigation measures would be implemented and how DOE would monitor the mitigation measures over time to ensure their effectiveness.

COMMENT CODE

O-1-5

4. I listened very carefully to the explanation of why the retention pond (s) is not shown on the site plan (Figure 3.2.1.5-1), but I suggest you make an educated guess. I think we deserve to know how the footprint will be affected.

RESPONSE

The text of the EIS concerning the retention basin has been clarified. At the Conceptual Design stage, the required size of the retention basin was approximated at 2 acres. The approximate location of the retention pond has been added to the figures showing the SNS site location for each of the four alternative locations.

LOCATION OF EIS REVISION(S): Figures 4.1-1, 4.2-1, 4.3-1, and 4.4-1; Sections 3.2.2.3, 3.2.3.6, 5.2.2.1.2, 5.2.5.2, 5.3.2.1, 5.3.5.2, 5.4.2.1, 5.4.5.3, 5.5.2.1, 5.5.5.2, 5.8.1, 5.8.2, 5.8.3, 5.8.4, 5.11.1, and 5.11.3

COMMENT CODE

O-1-6

I would also be surprised if a heated discussion did not take place over increased flow to WOC to White Oak Lake to White Oak Dam along with the attendant subjects of velocity, erosion, sediment, transport, etc., and increase in radionuclide releases. In 5.2.2.1.2 it is stated in the last paragraph that “actual flow over White Oak Dam would be lost in the noise of monthly ...” and “Accordingly, the effect of the proposed SNS on radionuclide releases from ORNL is considered minimal.” One does not necessarily follow the other and more precise language is in order.

RESPONSE

Flow of radionuclides over White Oak Dam is the product of flow rate and nuclide concentrations in White Oak Lake. The estimate of increased radionuclides over the dam is based on increased flow into the White Oak Lake, not additional contributions of radionuclide concentrations to White Oak Lake. Even if 100 percent of the discharge of the proposed SNS were to reach White Oak Lake, then only 4 to 15 percent increase in flow would be observed. This, however, contrasts to monthly variance in flow due to changing precipitation in the 100 to 200 percent range. Moreover, as discussed in Section 5.2.2.1.2, the majority of discharge from the proposed SNS would be lost before it reaches White Oak Lake and the amount that reaches the lake would dilute the radionuclide concentrations, thereby reducing the flux over the dam.

COMMENT CODE

O-1-7

The remainder of the Draft EIS is acceptable, but I will wait for the Final version.

RESPONSE

DOE appreciates the comment.

COMMENT CODE

O-2-1

On page 4-111, Vol. II, there is a minor mistake on the map (Fig. 4.2.10.1-1). The 4-lane highway between Santa Fe and Espanola is listed incorrectly.

Signage shows an Interstate Icon with 285 inside. Road is US-84/US-285. Signage should show a simple

 instead of  the Interstate symbol.

RESPONSE

The top-shaded shields normally used to designate interstate highways have been replaced with the white-background shields used to designate U.S. highways. The labeling on the major highway between Santa Fe and Espanola has been revised to indicate U.S. Highways 84 and 285.

LOCATION OF EIS REVISION(S): Figure 4.2.10.1-1

COMMENT CODE

O-2-2

Otherwise, the draft E.I.S. looks good.

RESPONSE

DOE appreciates the comment.

COMMENT CODE

O-3-1

As Chairman of the Knoxville Area Chamber Partnership, I want to express my support for the Spallation Neutron Source because of the positive impact it will have in our region and, more importantly, our nation.

The Spallation Neutron Source is important to the future of the United States as our nation seeks to maintain its technological and research supremacy in the 21st Century global economy.

Researchers from industry and universities from around the country will come to Oak Ridge to use the SNS's research capabilities. Industry partners will create new materials that will produce jobs and promote economic growth.

It is in support of this larger national endeavor that I endorse construction of the SNS in Oak Ridge.

RESPONSE

DOE appreciates the comment.

COMMENT CODE

O-4-1

As Chairman of the Blount County Chamber of Commerce, I want to express my support for the Spallation Neutron Source because of the positive impact it will have in our region and, more importantly, our nation.

Appendix A

The Spallation Neutron Source is important to the future of the United States as our nation seeks to maintain its technological and research supremacy in the 21st Century global economy.

Researchers from industry and universities from around the country will come to Oak Ridge to use the SNS's research capabilities. Industry partners will create new materials that will produce jobs and promote economic growth.

It is in support of this larger national endeavor that I endorse construction of the SNS in Oak Ridge.

RESPONSE

DOE appreciates the comment.

COMMENT CODE

P-1-1

On page S-39, Table S 1.5.2-1 there is a discussion of land use impacts and a statement that "...no brownfield sites ... are available." This implies that no suitable sites were considered within the immediate area. I would like to suggest that at least one brownfield site, and perhaps others, are indeed available in the Oak Ridge Reservation and should be considered for the SNS site.

As discussed in the section on land use impacts, Section 5.7.1.8, page 5-168, the White Wing Scrap Yard site is being considered as a CERCLA disposal area. This site might also be an ideal "brownfield" site for the SNS.

The site is adjacent to ED-1 and a positive land use interaction of this "brownfield" site would be the added development for ED-1 in terms of a future hotel and potential private "spinoff" development at ED-1 that is supported by scientific work at the SNS. This location also makes the SNS more accessible to the private sector. Siting the SNS at this location can help to improve or accelerate the economic redevelopment of the City of Oak Ridge and the surrounding four county region.

Other benefits would include easier road way access and a reduction in the cost of remediation for the site, as it can be left as a "brownfield" with more relaxed cleanup or risk assessment criteria. This is clearly a better land use for this location than as a future disposal site.

RESPONSE

The White Wing Scrap Yard is a major brownfield site located on the ORR near the intersection of State Highways 58 and 95. It consists of approximately 30 acres of land known to be radioactively contaminated. This contamination extends to areas of land immediately adjacent to this area on all sides and extends along two unnamed tributaries of Bear Creek that flow out of this area to the south and southeast. This site would not be an environmentally desirable location for the proposed SNS because of its location relative to environmentally sensitive areas and the presence of a potentially unstable geological feature, as described below.

The southeast corner of the scrap yard contains portions of Habitat Area 7, Aquatic Natural Area 2, and a wetland area. In addition, this site is closely surrounded on all sides by the rest of these areas, small streams and their floodplains, Aquatic Natural Area 3, and Natural Areas 2, 4, 24, and 50. If the footprint of the proposed SNS were superimposed with varying directional orientations on all or a portion of the White Wing Scrap Yard, it would extend beyond the scrap yard boundaries and into various combinations of these natural features. Implementation of the proposed action would potentially impact these features.

A thrust fault line underlies the southwest corner of the White Wing Scrap Yard. If the SNS were constructed on this site, this fault line would either crosscut a major portion of the SNS footprint or be immediately adjacent to it, depending on the exact position and directional orientation of the footprint. A major criterion used during the site-selection process for the proposed SNS was avoidance of ORR sites with geological faults. Construction of the SNS on or adjacent to such geologically unstable features would add another mechanism for beam loss by equipment misalignment and add to equipment and soils activation during SNS operations.

The process of selecting the preferred site for construction of the SNS on the Oak Ridge Reservation was a two phase process. In the first phase, the entire reservation was screened to eliminate areas that were not suitable for construction of the SNS. Brownfield and greenfield areas of the reservation were both included. Areas of land within the ORR with waste area groupings, environmental restoration projects or waste management areas were eliminated from consideration because these areas would require cleanup, with some attendant uncertainty on the extent of cleanup required, prior to excavation for the SNS foundations. This activity could increase worker exposure to radioactive and nonradioactive contaminants and would require the disposal of material removed during clean up in a licensed land fill. This could affect both the budget and schedule of the project. Working in a contaminated area could increase labor costs and disposal costs of the contaminated materials. Coordinating with the Environmental Management program for the cleanup of these areas may resolve the budget issue, however, long schedule delays may result. Coordination of this construction effort with the requirement of RCRA or CERCLA for cleanup of these areas could add a year or more to the construction schedule of the SNS. Siting the SNS in a waste management area could require cleanup of the area, with it associated cost increases and schedule delays, and possibly the relocation of waste management activities. The result of this first phase was the identification of four candidate sites, however, none of these were brownfield sites.

The second phase consisted of a comparative evaluation of the candidate sites using specific site evaluation criteria. One of the Functional Criteria was the avoidance of contaminated soils. One of the Health and Safety criteria was avoiding existing hazardous materials areas and waste areas (i.e. Waste Area Groups and RCRA sites). Again, these criteria were included to avoid the increased risk to construction workers and the increased costs and schedule delays associated with placing a large scale construction project at a site with contaminated soils or hazardous materials.

LOCATION OF EIS REVISION(S): Sections S 1.4.2 and 3.2.4.2

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COMMENT CODE

P-1-2

Another area of concern that is not clearly addresses in the EIS is the topic of karst formations associated with the siting of the SNS.

The region is noted for its karst formations, which have the potential to dramatically impact the construction of new facilities. The Copper Ridge area has been known to contain sink-holes and caves. Perhaps the White Wing Scrap Yard site is better suited from a karst standpoint and is less likely to have these impacts.

RESPONSE

The site-selection study for the proposed SNS at ORNL is presented in its entirety in Appendix B of the EIS. As indicated in this study, karst formation (solution-conduit groundwater flow) was not used as a specific criterion for evaluation of the ORNL candidate sites. However, during the site-selection process,

Appendix A

the Reservation Management Organization (refer to first memorandum in Appendix B, Exhibit 3) raised possible karst formation beneath the proposed Chestnut Ridge site as a potential issue for SNS construction. Consultations between the Reservation Management Organization and SNS project resulted in resolution of this issue (refer to second memorandum in Appendix B, Exhibit 3). The content of the resolution is described in this response.

Present information about foundation stability requirements for the proposed SNS, preliminary foundation design work, preliminary core borings, and shock test data from ORNL indicate that implementation of the proposed action on the Chestnut Ridge site would not be a problem, if it is correctly approached. Furthermore, it should be noted that construction on karst topography is not uncommon in the Knoxville area or on the ORR. Additional geological studies have been planned to further confirm this resolution of the karst issue prior to construction on the site.

Approximately 90 percent of the White Wing Scrap yard is underlain by the Chickamauga Supergroup, a sequence of gray limestones and red mudstones overlying the dolostones of the Knox Group. Evidence for karst development has been documented in the Chickamauga Supergroup.

A thrust fault line runs through the southwest corner of the White Wing Scrap Yard. The area immediately south of this fault line, including the remaining 10 percent of the scrap yard, is underlain by the Rome Formation. Karst development is not characteristic of this formation.

The footprint of the proposed SNS would be much larger than the White Wing Scrap Yard. This would result in constructing large portions of the facility on the Rome Formation and the Chickamauga Supergroup. As is the case with the Chestnut Ridge site, DOE does not view the karst potential of the latter group as an impediment to construction of the proposed SNS. However, as noted in the response to Comment P-1-1, other environmental characteristics of the White Wing Scrap Yard make it an undesirable location for the proposed SNS.

.....
COMMENT CODE

P-2-1

Before documenting my comments, I want to make it clear that I fully support the mission of the SNS and its siting in Oak Ridge. My comments are made not to disparage or negate the importance of the SNS to the future of neutron-based research in the U.S. or at Oak Ridge but to assure that all-important issues potentially affecting public welfare are adequately and sufficiently addressed. The issues raised in the comments and recommendations that are provided below are just as valid for public consideration and for DOE or other official resolution not matter where the SNS is sited. I strongly recommend that Oak Ridge be the selected site for SNS.

RESPONSE

DOE appreciates the comment.

.....
COMMENT CODE

P-2-2

Comment: SNS EIS Sects. 6.1.3, 6.1.4, 6.1.10, and 6.1.11 and SNS CDR Sects. 8.8 and 9.1 fail to define the legal bases for how the SNS radioactive wastes are to be classified and regulated for disposal. Both sets of cited sections fail to indicate under which statutes or laws and under which regulatory authorities the SNS radioactive wastes are to be regulated, and both sets use terminology (specifically, "mixed-waste") without further clarifying why the statutory definition of the term does not apply to SNS-

generated radioactive wastes. Lack of clarity and specificity is unacceptable because the disposal of radioactive wastes from the SNS involves complex and conflicting statutory and regulatory matters that have not been resolved by the government previously (see U.S. Nuclear Regulatory Commission, NRC, documents NUREG-1310 and SECY-92-325). If DOE at this juncture does not properly address this situation, there is confusion as to who is the legally empowered regulator for such wastes and what are the proper regulatory requirements. The fact is that the replaceable metallic components in the SNS target will under proton-neutron irradiation become as highly radioactive as any power reactor component irradiated in the core where such reactor-irradiated material would be classified as Greater-than-Class-C Low-Level Radioactive Waste (GTCC LLRW) under NRC regulations at 10 CFR Part 61 and would require ultimate permanent disposal in a geologic repository unless the NRC approves an alternative disposal. In the DOE system, however, appropriate regulatory requirements for disposal of these wastes have never been defined. The authors of both the EIS and the CDR do the public a disservice by failing to present this problem in a clear and straightforward manner. Although SNS EIS Sect. 6.1.2 alludes to one key aspect of the problem in the context of radioactive materials affecting water quality in site effluents, the issue is never detailed in the context of radioactive waste management and classification.

The reason that an issue exists is because SNS-generated radioactive materials do not (*sic*) meet the statutory definitions of source material, special nuclear material (SNM), or by-product material as defined in the *Atomic Energy Act of 1954* (AEA), as amended, and codified at 42 U.S.C. 2014. Thus, in a strict legal sense, SNS-generated radioactive wastes appear to fall solely under the *Resource Conservation and Recovery Act* (RCRA) as meeting the definition for “solid waste” codified at 42 U.S.C. 6903(27), are thereby (*sic*) excluded both from the definition of “mixed waste” codified at 42 U.S.C. 6903(41) and from the DOE mixed waste reporting requirements at 42 U.S.C. 6939c, and should be regulated only as “hazardous waste” under the definition at 42 U.S.C. 6903(5) by the Environmental Protection Agency (EPA) and by the states under the *Federal Facilities Compliance Act* (FFCA). Therefore, SNS-generated highly radio-toxic or high-hazard radioactive wastes are subject to listing as hazardous waste under 42 U.S.C. 6921 and subject to all the standards and permitting requirements at 42 U.S.C. 6922, 6924, and 6925. Since EPA and the states (except perhaps for Illinois) have not promulgated land disposal restrictions previously for this type waste, it is expected that new EPA and/or state rulemaking, additional Federal EISs, and public meetings are required to bring closure by defining proper statute-based regulatory controls for the handling and disposal of SNS radioactive wastes. The draft EIS addresses none of this. There is no mention in the draft EIS that the SNS radioactive wastes fall into a category of wastes that NRC indicates in NUREG-1310 that Congress refers to as “orphan wastes,” that DOE has itself called “unregulated wastes” (*Federal Register*, 60, pp. 13424-13425, March 13, 1995), and for which EPA has failed to take regulatory ownership in spite of the law.

DOE has previously acknowledged EPA authority over accelerator-generated (non-by-product) radioactive materials. This previous DOE acknowledgment of EPA authority has been (1) implicit both in 10 CFR Part 962 and in Definitions 3.a and 27 of DOE 5820.2A that respectively delineate the demarcation of authority between the AEA and RCRA and (2) explicit in Chapter IV of DOE 5820.2A that specifies that accelerator-generated radioactive materials are to be regulated under RCRA and/or as “residual radioactive material” under 40 CFR Part 192, where the latter EPA regulation is not really applicable. It is noted that the recent draft DOE O435.1 attempts to redefine DOE authority under the AEA-based oversight of radioactive wastes to include accelerator-generated radioactive wastes, but I have noted to DOE in separate correspondence that this proposed revision to DOE 5820.2A requirements is not advisable because (1) there is an absence of clear statutory authority and (2) DOE needs to issue regulations not directives to manage radioactive wastes in an acceptable and enforceable manner. Thus, notwithstanding the broad regulatory authority granted both DOE and NRC at 42 U.S.C. 2201(i)(3) and (p) and with due consideration to the DOE General Counsel’s interpretation of this authority with regard to the regulation of radiological hazards (Sect. B.1, *Federal Register*, 61, pp. 4209-4910, February 5,

1996), the AEA and RCRA appear to be very clear when considered in combination that the types of waste to be generated in SNS are not subject to DOE regulatory authority. It is also noted that DOE has used the terms “unregulated waste” and “special case waste” (*Federal Register*, 60, pp. 13424-13425, March 13, 1995) to refer to certain types of non-AEA radioactive wastes, that is, “unregulated” wastes that pose the same hazards as GTCC LLRW are to be treated as “special cases” under Sect. III.3.i(4) of DOE 5820.2A. However, DOE is understood to be dropping the “special case waste” terminology. This change in terminology is presumably due to the criticism stemming from the multiple findings of DOE activities involving the production or storage of special case waste with no clear path forward to disposal. These findings are documented in the DOE report, “Complex-Wide Review of DOE’s Low-Level Waste Management ES&H Vulnerabilities,” May 1996, submitted in response to Defense Nuclear Facilities Safety Board Recommendation 94-2. Finally, in the context of possibly considering DOE regulatory oversight of radioactive wastes, it is noted that DOE’s issuance of regulations to implement the *Price-Anderson Amendments Act of 1988* is way behind schedule, is in abeyance, and has never proposed nor attempted to implement consistent rulemaking for radioactive waste classification and management analogous with and equivalent to that of the NRC regulations at 10 CFR Parts 60 and 61 for AEA-regulated materials. Thus DOE appears to have neither the statutory nor the regulatory track record to provide the regulatory structure needed to control the classification, treatment and disposal of SNS hazardous radioactive wastes.

It is noted that the statutory issue could be resolved if Congress would amend the definition of by-product material as it appears in 42 U.S.C. 2014(e)(1) from reading “any radioactive material (except special nuclear material) yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizing special nuclear material” to read instead “any radioactive material (except special nuclear material) yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizing *atomic energy or* special nuclear material.” This wording change would adapt the intent of the words used in 42 U.S.C. 2013(c) regarding the purpose of the AEA and make by-product material consistent with the definitions both of “atomic energy” in 42 U.S.C. 2014(c) as being “all forms of energy released in the course of nuclear fission or nuclear transformation” and of “utilization facility” in 42 U.S.C. 2014(cc)(1) as being “any equipment or device, except an atomic weapon, determined by rule of the Commission to be ... peculiarly adapted for making use of atomic energy in such quantity as to be of significance to the common defense and security, or in such manner as to affect the health and safety of the public.” The recommended amendment would permit radioactive materials produced by particle accelerators and nuclear fusion devices to be classified as by-product material and thus subject to regulation by DOE and NRC but would exclude naturally-occurring radioactive materials except those covered under 42 U.S.C. 2014(e)(2). This change would permit NRC to license the use of such materials under 42 U.S.C. 2111 and thereby obviate the NRC’s reluctance to assert licensing and regulatory authority, including waste classification, over this type of radioactive waste by meeting the “consistent with existing law” provisions at 42 U.S.C. 2021(b)(9)(B) and 10101 (12)(B) and (16)(B). Therefore, if this amendment were enacted, the regulation of the radio-toxicity of SNS-generated radioactive wastes and the safe disposal of these wastes would fall under the statutory provisions of the AEA, the *Nuclear Waste Policy Act* and the *Low-Level Radioactive Waste Policy Act* as opposed to RCRA only as is the case without the amendment. However, the proposed amendment would place the production and use of all radioactive medical therapy and diagnostic isotopes that are produced in small accelerators in hospitals under NRC regulations, but this control would in most cases simply be delegated back to the states, which already regulate such isotopes by default, by the NRC under 42 U.S.C. 2021(b)(1). The states would thus have enhanced authority under Federal law since litigation of contested violations could be referred to Federal courts if needed.

Finally, SNS EIS Sect. 6.1.11 states: “The Toxic Substances Control Act (TSCA) regulates the manufacture, use, treatment, storage, and disposal of certain toxic substances not regulated by RCRA or

other statutes.” While this statement is true with respect to the AEA as provided at 15 *U.S.C.* 2602(2)(B)(iv), this statement implies incorrectly that the treatment, storage, and disposal of certain hazardous materials are not subject to RCRA. Please note that the treatment, storage, and disposal of all hazardous materials except AEA-defined materials are covered under RCRA; that TSCA provides the statutory basis for implementing by regulation additional treatment, storage, and disposal requirements as may be appropriate for certain toxic substances generated for commercial purposes and regulated under TSCA; but that, as provided at 15 *U.S.C.* 2608(b) and 42 *U.S.C.* 6905(b), TSCA and RCRA are fully coordinated as the statutory bases for regulating the treatment, storage, and disposal of hazardous materials including toxic substances regulated under TSCA. Obviously, if this were not the case, TSCA regulations at 40 CFR Subchapter R would contain treatment, storage, and disposal requirements that are instead given in 40 CFR Subchapter I. It is also noted that in this regard that the NRC has taken the position in SECY-92-325 that accelerator-generated radioactive materials that are produced for commercial purposes without using source material, special nuclear material, or by-product material are not subject to the AEA but are subject to regulation by the states and by the EPA under TSCA. This basis for the NRC’s position applies to any radionuclides produced for commercial purposes in the SNS. This will not change unless Congress changes the AEA such as by redefining by-product material as noted above or makes some other set of changes to TSCA.

Recommendations:

- 1-1 The above-cited sections in the SNS EIS and CDR should be revised to indicate that all SNS radioactive wastes are subject to regulation by EPA and the state of siting under RCRA and FFCA. The inapplicability of the AEA to the regulation of SNS radioactive wastes should be clarified and explained. The use of the term “mixed wastes” should be deleted. The planned path forward should be outlined as to how DOE intends to obtain EPA and state rulemaking to define appropriate land disposal restrictions for SNS radioactive wastes.
- 1-2 The SNS EIS should clarify that any radionuclides produced for commercial purposes in SNS without using source material, special nuclear material, or by-product material will be regulated by the state of siting or by the EPA under TSCA and that disposal of such commercial products when no longer used will be in accordance with TSCA/RCRA regulations or appropriate state regulations. The SNS EIS should commit that DOE will obtain TSCA permits for the production of any radionuclides in SNS for commercial purposes consistent with the NRC’s position given by SECY-92-325.
- 1-3 SNS EIS Sect. 6.1.11 should be revised to correct the implication that TSCA and RCRA are not coordinated laws.
- 1-4 As an alternative to Recommendations 1-1 and 1-2 above, the SNS EIS could indicate the steps planned (1) to obtain an amendment to the AEA by Congress that will redefine by-product material to include SNS-generated radioactive materials and (2) for DOE and NRC to work together with the NRC agreement states to implement appropriate regulations under the amended AEA and related legislation.

RESPONSE

DOE believes that it has properly and adequately described its authority to build and operate the proposed SNS, including the rules, order, and policies governing the management of products and waste the SNS might generate.

.....
COMMENT CODE

P-2-3

Comment: In reviewing the draft EIS and the CDR, I have attempted to understand the bounding or worst case accidents so as to understand the degree of need for active prevention and mitigation features and the reliance if any that can be placed on inherent and passive features to prevent accidents and to mitigate the consequences of accidents. Although Sect. 3.1.2 of Appendix A to the draft EIS acknowledges the importance of the beam trip, I find that the “structured” process for defining the accident source terms, as given in Appendix A to the draft EIS, obscures key assumptions about the human factors in the assumed operability of safety systems and the high dependence of success paths both upon a safety culture that is yet to be created and upon institutional controls that have yet to be defined or specified. This situation is also obscured in CDR Chapters 7 and 8 so that safety-system top-level requirements are never well defined.

I do readily acknowledge that the total radioactive source term in SNS is very, very small in comparison to a large research or power reactor and that, during normal operation, the thermal margins in terms of temperature appear quite substantial to conditions that would fail the target vessel and the vessel confinement. However, unlike an NRC-licensed nuclear research reactor that would be designed and regulated under 10 CFR Part 50 Appendix A to meet NRC General Design Criterion (GDC) 11, “Reactor inherent protection,” the SNS accelerator and target apparently lack any inherent protective or mitigative feedback mechanism to control the rate at which thermal energy is deposited in the target mercury by the proton beam. The singular importance of this fact is significant but has not been emphasized in the limited safety analysis presented in the EIS.

Thus, in SNS, the control of target heating during normal operation or upset conditions relies totally upon either the human operator or automatic detection and actuation systems that are designed, fabricated, constructed, configured, maintained, and tested by humans. The structures around the target provide the only inherent features that can passively prevent or mitigate a release of radioactive materials in the event of a worst case accident in which the target is vaporized. However, the functional integrity of the confinement structures to prevent or mitigate a release of radioactive materials will be maintained and not bypassed only if conditions in the confinement, including the effects of an untripped beam, do not present a serious challenge to the confinement structure and particularly to the less massive barriers that would be in place if active mitigation features fail to operate during an upset to secure experimental access to the target as needed during operations to extract the neutron beams.

The fragility of relying solely on human operators and automatic prevention and mitigation systems, which can be bypassed by human operators, in a nuclear system that lacks inherent protective or mitigative feedbacks was illustrated most dramatically and notoriously in the accident at Chernobyl Unit 4. While the possible consequences and therefore the risk of a worst case accident in SNS is in no way comparable to what happened at Chernobyl, it must be remembered that the SNS mercury target is not merely a jar of radioactive liquid sitting in a hot cell where the standard practice is not to load hot cells containing radioactive materials with large quantities of highly flammable or explosive materials nor to place the jar in the path of an explosive or incendiary projectile. Instead the SNS target might better be characterized as an actively-cooled jar of radioactive liquid sitting in a hot cell with access ports more similar to those of a glove box and where the jar is heated by a device that is technically similar to the directed energy weapons regulated in international trade by the U.S. Department of State on the United States Munitions List at 22 CFR 121.1, Article XIII(h). An extended failure to trip the beam in an accident that is initiated by target under-cooling can lead to the vaporization of the target and adjacent target structures and potentially lead to energetic interactions with confinement structures and barriers contributing to loss of confinement integrity. The presence of cooling water systems nearby the target could lead to steam explosion of confinement over-pressurizations.

The SNS accelerator beam may also be potentially classifiable as the energizing or effecting mechanism in a large “utilization facility” that effects “nuclear transformations” and satisfies the portion of the definition for utilization facility in the AEA at 42 U.S.C. 2014(cc)(1) as being “any equipment or device, except an atomic weapon, determined by rule of the Commission to be ... peculiarly adapted for making use of atomic energy ... in such manner as to affect the health and safety of the public” Although NRC has elected to classify even the smallest nuclear reactor as a utilization facility subject to a “minimum” set of health and safety regulations at 10 CFR Part 50, no such equivalent determination has ever been made by the NRC with respect to the utilization of atomic energy through the nuclear transformations that are induced by the accelerator beam in the target of an accelerator facility. Perhaps this is because the radioactive materials produced in an accelerator target are not AEA-regulated materials or perhaps because to date most commercial particle accelerators have been very small and with very low-power beams compared to what is envisioned for SNS. The historical safety and health physics performance of small accelerators is summarized only in the DOE report SLAC-327, *Health Physics Manual of Good Practices for Accelerator Facilities*, April 1988. In Sect. 2.6, “Beam Containment,” pp. 28-30 of this report, examples are given of how failures to control the beam in small accelerators can lead to melting or vaporization of that portion of the target or other structures exposed to the uncontrolled beam. The substantial radiation hazard posed by the irradiated non-fissionable, heavy-metal targets in the larger DOE accelerators is also a matter of record (See Occurrence Report Number ALO-LA-LANL-RADCHEM-1996-0010, “Unposted High Radiation Area on the Rooftop above TA-49-1 Hot Cells,” 10/11/1996).

As implied in Sect. 3.1.2 of Appendix A to the EIS, the bounding accident for the SNS would be the failure of target cooling with simultaneous failure to trip the beam for an extended period of time. However, Sect. 3.17 Table 3.7 and Exhibit F Table F.1 of Appendix A to the draft SNS EIS indicate that one of the two bounding “beyond design basis accidents” analyzed in the draft EIS is the failure of target cooling with the failure of two out of three beam trip mechanisms such that there is a slightly delayed beam trip but the delay causes beam window failure leading to a mercury spill. The so-called bounding accident addressed in the draft EIS assumes that both the Target Protection System (TPS) and the Beam Permit (BP) fail but that the Personnel Protection System (PPS) operates quickly either automatically or in response to an operator action. This accident is indicated in the EIS to be beyond design basis because the estimated combined frequencies of component failures produces an event sequence frequency that is greater than 10^{-8} /year but less than 10^{-6} /year. The assumption of a simultaneous failure of the PPS is indicated in a footnote in Table 3.7 of Appendix A to have a frequency of occurrence that is less than 10^{-8} /year.

However, the accident failure frequencies used in the draft EIS are, according to Sect. 1.2 (P. A-14) of Appendix A, “based on experience and on engineering judgement considerations.” In other words at this stage of the conceptualization of an as yet unbuilt and non-prototyped facility, the failure frequencies are based on unreviewed and non-validated guesses. It is highly likely that these guesses were developed by nuclear engineers with the tacit assumption that the typical regulated institutional controls of NRC-licensed nuclear systems will apply to SNS (that is, a continuously updated safety analysis report, technical specifications, a quality assurance program, configuration management and the associated procedural controls that are regulated by NRC against commitments made in the safety analysis report).

Although I am a proponent of the usefulness of risk-based regulation for nuclear systems when used as a guide to better understand the margins and conservatism in deterministic accident analyses and to address risk cliffs that may lurk beyond the design basis, it is noted that SNS lacks a key defense-in-depth component available in nuclear reactors by not meeting NRC GDC 11 and that there is no guarantee that SNS will be subject to equivalent institutional controls since, historically within DOE, accelerator facilities have received a much reduced level of regulation and external oversight compared to reactors. In

general, copies of the safety assessment documents for DOE accelerators are not available to persons outside the facility and are not maintained available for outside review either by the public or by DOE safety oversight organizations.

Thus, I find fault with the underlying assumptions of the risk assessment in the EIS at this early stage of SNS design and with the failure to address a deterministic worst case scenario for assessing defense-in-depth. One cannot rely on hand-waving risk analyses for non-existent systems for which there is no data base for making integral estimates of system reliability that account for as-built configurations and the impacts of institutional controls. In this case, you must be deterministic and bounding in any accident or health-risk analysis.

Consistent with NRC's requirements for deterministic safety analyses of anticipated transients without scram (ATWS) for reactors, which have inherent feedbacks to mitigate such accidents, and consistent with NRC's treatment of operator actions wherein it is typically assumed that the operator takes no action or the wrong action for the first 10 minutes of a transient, it would appear to be more prudent and bounding if the SNS EIS addressed loss of target cooling with failure to trip the beam for a period of time up to 10 minutes. Since water-cooled systems are nearby, the potential for steam explosion or over-pressurization of the confinement should also be assessed under the worst case assumptions. More simply, it may be best to assume that all radioactive materials in the target environs are vaporized and released to the atmosphere similar to the conservative and bounding assumptions in NRC report NUREG-0396 that was used to establish the bases for 10 CFR Part 50, Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities." It should be sufficient to determine for the most adverse weather conditions the boundaries of the zone around the SNS site where such an accident would lead to doses that exceed the EPA minimum guidelines for sheltering and evacuation (that is, 1 Rem whole body and 5 Rem thyroid). Beyond that boundary, which would hopefully be shown not to pass beyond the one-mile exclusion zone for the site, the SNS can be considered to be passively safe no matter what mistakes the operators might make. This is analogous to the approach proposed for the Modular High-Temperature Gas-Cooled Reactor that was being designed to incorporate numerous diverse and redundant, inherent and passive safety features that have no equivalent in the SNS.

Since my home in Oak Ridge is located on a hill about 10 miles Northeast of the proposed site for SNS, as a professional nuclear engineer, I am most interested in knowing the results of such a bounding accident analysis in which no optimistic assumptions are made about the performance of systems and operators. I prefer knowing that no matter what mistakes are made by the operators on site I have no need to be concerned off-site; I assume that my fellow residents of Oak Ridge and surrounding areas feel the same way. Of course, my requirements stem from treating SNS as a nuclear facility. Since the radio-toxic substances in the SNS target are not AEA-regulated materials, other bounding accident scenarios may be posed more analogous to the types of accident and emergency response situations that can occur in industries regulated by EPA and the states. However, whether one draws upon historical worst-case precedents at Chernobyl or Bhopal, the fragility of relying on the human operator and the importance of institutional controls must be addressed in setting the bounding case for public risk. My assumption is that it can be shown that no substantive risk exists; I expect that the final EIS will provide the substantive documentation to validate this assumption and not confuse the issue with hand-waving discussions about reliabilities for untried and nonexistent systems, operators, and procedural controls. While this approach will establish the hazard or bounding consequences for public health off-site, a similar approach is recommended for establishing the hazard or bounding consequences for both occupational safety and health and environmental insult on-site. It appears that the SNS approach used to date to evaluate hazards under DOE 5480.23 and DOE-STD-1027-92 always gets shortcut by the assumption that the target is never vaporized so the assumed release fractions for non-volatile radioactive materials are always much less than 1.0. Thus the strict requirements of Sect. 8.c of DOE 5480.23 and Sects. 3.1.2 and 4.1.1 of DOE-

STD-1027-92 seem to be violated by the fatal logic flaw of assuming that which you want to prove. Such logic may unfortunately be taken as further proof by some persons that DOE is inherently incapable of honest self-regulation. I hope that this is not the case.

Recommendations:

- 1-1 The SNS draft EIS and CDR should be revised to indicate that equipment relied upon to perform safety functions will be classified as safety-related and that DOE is committed to assuring that all safety-related equipment is subject to both technical safety requirements and configuration management controls as required for the DOE research reactors. This includes the TPS, BP and PPS.
- 2-2 The accident scenario for the beyond-design-basis event to be provided in the final EIS should address the consequences of the untripped beam (up to 10 minutes) as it affects the target and confinement. Consistent with NRC's treatment of ATWS, the failure to trip the beam should be applied to all events in the which cooling is lost to the target both loss of coolant and loss of flow. The treatment of the accident upon which emergency planning is to be based should be as conservative as the NRC assumption underlying 10 CFR Part 50, Appendix E (namely, total loss of target integrity and total loss of confinement integrity).

RESPONSE

As discussed in Appendix C (page A-16) of the DEIS, the SNS Target Facility has received initial designation as a Hazard Category 2 (HC-2) nuclear facility. The safety of the SNS Target Facility will be evaluated and documented in accordance with DOE Order 5480.23, Nuclear Safety Analysis Reports, and other related orders. Hazard evaluation and safety analysis will be done under the guidance of DOE-STD-3009-94, Preparation Guide for U. S. Department of Energy Nonreactor Nuclear Facility Safety Analysis Reports (SAR). One of the major purposes of the SAR is to justify and document which systems are necessary to maintain the high degree of safety and defense in depth against environmental releases necessary for DOE facilities. After DOE approves the preliminary SAR for the facility, the SNS may be constructed, and after the final SAR is approved, it may be operated. Since the purpose of the SAR is to address concerns such as those voiced in this comment and since the SAR for the SNS will not be a classified or restricted document, the preliminary SAR would be available to the public following approval by DOE.

The SAR designations of safety-related equipment result in a graded scale of higher design, operational surveillance, and configuration control. The requirements regarding safety-related equipment, as documented in the SAR, are expressed concisely in a related document called Technical Safety Requirements (TSR). This document sets down the conditions under which the facility will be authorized to operate. The DOE requirements for TSR are specified in DOE Order 5480.22. The SAR/TSR process, developed and refined by DOE over the past decade with its many nonreactor DOE nuclear facilities, will ensure that SNS safety-related structures, systems, and equipment, including beam cut-off systems, are appropriately designated, configured, operated, and maintained.

The beyond-design-basis accident presented in the DEIS is sufficiently representative of very-low-probability accident scenarios. The reference in Recommendation 2-2 to the anticipated transients without scram issue in power reactors is not relevant because of the many physical and conceptual differences between reactors and accelerators. For example, one of the reasons the anticipated transients without scram cases are analyzed for reactors is that reactors have only mechanisms for accomplishing rapid shutdown (i.e., insertion of control rods). By contrast, three automatic systems would be available to cut off the beam for the SNS, and the control room operators would act as a back up to the three fast-

acting automatic systems. The simultaneous failure of all these for any significant time, even 10 minutes, would go beyond what is intended for the beyond-design-basis category and what is reasonable for the SNS. The design, configuration control, and maintenance requirements that will be in place for safety-related systems, such as the Target Protection System and the Personnel Protection System, via the SAR and TSR are discussed above. These will be high-integrity systems that employ multiple sensors and logic channels to achieve the desired high reliability. The SNS study of the operator action to effect beam cut off in the event of severe target abnormalities showed that operator action within a 1-minute period would be highly probable.

The second part of Recommendation 2-2 concerns emergency preparedness. The SAR being prepared for the SNS is required by DOE Order 5480.23 to address emergency preparedness. The SAR will document facility compliance with DOE emergency preparedness requirements. The emergency planning provisions for protection of the public and workers will be based upon the SAR hazard evaluations and accident analysis of design-basis and beyond-design-basis accidents.

COMMENT CODE

P-2-4

3. Recommendations based on Other Considerations:

Comment: Sect. 1.2 (p. 1-7) of the draft SNS EIS indicates that the construction of SNS is a “global concern” from the standpoint of filling a “neutron gap” in research capabilities. The SNS is proposed to be a U.S. research facility, but it is inferred that SNS will be open to international research collaborations. The significance of SNS in the context of intentional collaborations and the sharing of its technology advances and advantages is not addressed in the draft EIS.

In particular, an issue that is not addressed in the SNS draft EIS is that which is addressed briefly in Sect. 1.6, “Non proliferation,” of DOE/EIS-2070D, December 1997, which is the draft EIS for locating the Accelerator Production of Tritium (APT) at the Savannah River Site. Sect. 1.6 of DOE/EIS-0270D asserts that “accelerator technology has been in use for more than 75 years,” that “the possibility of producing special nuclear material (i.e., plutonium) using an accelerator was recognized several decades ago,” and that the “APT is the first known accelerator proposed for a mission to produce weapons materials in a sustained production operating mode.” The latter statement is simply not true since the formerly-classified Materials Test Accelerator pursued by the Atomic Energy Commission in the late 1940s and early 1950s was a project dedicated to developing an accelerator-driven system to produce weapons plutonium as an alternative to constructing large production reactors. Sect. 1.6 of DOE/EIS-0270D also indicates that using “an accelerator to produce special nuclear materials in quantities which could be a proliferation concern requires a particle beam power of approximately 1 megawatt or greater” and that “research accelerators with beam powers in the 1 megawatt range have been viable for at least 20 years.” As noted in the SNS draft EIS, SNS is to use a 1 MW beam initially and upgraded to 4 MW later.

Article III of the *Treaty on the Non-Proliferation of Nuclear Weapons* stipulates that “Each State Party to the Treaty undertakes not to provide:”(b) equipment...especially designed or prepared for the...production of special fissionable material, to any non-nuclear-weapon State for peaceful purposes, unless the source of special fissionable material shall be subject to the safeguards required by this Article.” However, there are currently no U.S. safeguards requirements or export controls placed on particle accelerators that DOE/EIS-0270D acknowledges are a potential proliferation risk at the beam power levels of the SNS. It is noted that the U.S. is a member of an international body called the Nuclear Suppliers Group (NSG) composed of signatories of the Nonproliferation Treaty. The guidance formulated by the NSG on issues of export controls includes the “Trigger List,” which triggers safeguards, and the

“Dual Use List.” Based on an earlier international agreement on safeguards, the Trigger Lists starts with export controls for reactor equipment for a facility that can produce as little as 100 grams of plutonium annually. This international standard has implications for accelerators operating with beam powers much, much less than 1 megawatt. These agreements, guidelines and lists are published in the International Atomic Energy Agency (IAEA) Information Circulars. A logical question that arises is that, in the absence of clear controls to prevent the diversion of accelerator technologies for purposes of nuclear weapons proliferation, how can one be sure that any international collaboration on SNS will not lead to the uncontrolled transfer of technology that can be used to promote the illegal production of special nuclear materials for nuclear explosive purposes. What pro-active measures does DOE intend to take to prevent or mitigate the risk of nuclear proliferation arising from the construction and operation of SNS? Sect. 1.6 of DOE/EIS-0270D indicates only that DOE is considering changes to its regulations at 10 CFR Part 810 that implement its authority under 42 U.S.C. 2077(b) although it is now one year since these words were published for public consumption and no such rulemaking has been proposed to the public. However, how does DOE intend to coordinate its actions on SNS effectively with the NRC and the Department of Commerce that have the primary responsibility for nuclear-related export controls under 42 U.S.C. 2139 and 2139a? How does DOE intend to coordinate its activities on SNS effectively with the Department of Commerce under its authority provided in Sect. 3(d) of Presidential Executive Order 12938 of November 14, 1994, “Proliferation of Weapons of Mass Destruction,” “to regulate the activities of United States persons in order to prevent their participation in activities that could contribute to the proliferation of weapons of mass destruction?”

Also, 22 CFR 121.1(a) stipulates that “The following articles, services and related technical data are designated as defense articles and defense services pursuant to sections 38 and 47(7) of the Arms Export Control Act (22 U.S.C. 2778 and 2794(7)).” Further, 22 CFR 121.1, Article XIII(h) lists “Devices embodying particle beam and electromagnetic pulse technology and associated components and subassemblies (e.g., ion beam current injectors, particle accelerators for neutral or charged particles, beam handling and projection equipment, beam steering, fire control, and pointing equipment, test and diagnostic instruments, and targets) which are specifically designed or modified for directed energy weapon applications.” While the SNS accelerator is not “specifically designed or modified for directed energy weapon applications,” how can one be sure that any international collaboration on SNS will be used to promote the illegal transfer of “services and related technical data” that could be diverted for purposes of developing directed energy weapon applications? What pro-active measures does DOE intend to take to prevent or mitigate the risk of the proliferation of enabling technology for directed energy weapon applications arising from the construction and operation of SNS? How does DOE intend to coordinate its activities on SNS effectively with the Department of State to preclude inadvertently violating the intent of the *Arms Control Export Act* by allowing the export of enabling technology?

Notably, high-energy particles such as those used in the beam of SNS release secondary energetic particles and radiations from collisions with target atoms through the process of nuclear spallation, which is a form of “nuclear transformation.” Energy released from the process of nuclear transformation is defined at 42 U.S.C. 2014(c) to be “atomic energy.” Per 42 U.S.C. 2014(d): “The term ‘atomic weapon’ means any device utilizing atomic energy, exclusive of the means for transporting or propelling the device (where such means is a separable and divisible part of the device), the principal purpose of which is for use as, or for development of, a weapon, a weapon prototype, or a weapon test device.” Thus, any directed energy weapon utilizing a particle beam energetic enough to induce nuclear transformation by effecting spallations in the target materials may apparently be inferred legally to be an atomic weapon if not a “weapon of mass-destruction.” None of the existing regulations specifically address this notable aspect of SNS-related technologies. Does DOE intend to address this aspect of SNS and its implications on how SNS technologies are to be regulated in international collaboration?

Recommendations:

- 3-1 DOE needs to revise the SNS EIS (1) to assess the risks posed by SNS to the proliferation of the capability to produce special nuclear material without safeguards and thereby to produce weapons of mass destruction and (2) to specify the active measures to be taken by DOE in coordination with the NRC, the Department of Commerce, and the NSG to prevent or mitigate such risks. In particular, DOE might indicate when the previously-indicated rulemaking for 10 CFR Part 810 can be expected.
- 3-2 DOE needs to revise the SNS EIS to assess the risks posed by SNS to the proliferation of directed energy weapons and to specify the active measures to be taken by DOE in coordination with the Department of State to prevent or mitigate such risks arising from international collaborations that might lead to the export of SNS technologies. DOE also needs to explain why directed energy weapons using beam energies comparable to SNS and incorporating technologies very similar to that used in SNS do not need to be regulated as atomic weapons.

RESPONSE

Fundamental particle accelerator technology to be used in the SNS facility is openly available around the world in both text and hardware. As pointed out in preface material to this comment, Article III of the Treaty on the Non-Proliferation of Nuclear Weapons discusses facilities “especially designed or prepared for the...production of special fissionable material.” The SNS facility is not “especially designed” for production of fissionable material, and its supporting research activities are focused on the nuances of creating sharply defined pulses of high energy particles - effectively reducing the potential integral particle flux and potential application to fissionable material production. Thus, the SNS facility would not create new special nuclear material production technology useful for the manufacture of weapons of mass destruction; therefore, the project adds no incremental proliferation risk. In the absence of incremental proliferation risk, DOE plans no antiproliferation actions associated with the SNS project. Regarding the reference to rulemaking for 10 CFR 810, draft rulemaking under consideration would address the use of accelerators for production of special nuclear materials. If such rules were enacted and if SNS technology were deemed to be important to special nuclear materials production, then approval by the Secretary of Energy would be required before its export. However, such rules are not currently in force, and the promulgation of regulations is outside the scope of this EIS for the proposed action to construct and operate an accelerator-based neutron research facility.

The SNS accelerator system generates proton ion beams, both negatively and positively charged, at up to the 1 GeV energy level. Such beams would be rapidly attenuated in air; therefore, they are of no practical application for a ground-based directed energy weapon. The specific technology used in this project is for equipment and facilities that are massive; therefore, they are not practical for space-based directed energy weapons. Thus, the SNS facility would not create new technology useful for the manufacture of directed energy weapons, and it is not subject to regulation as any form of a weapon.

COMMENT CODE

P-3-1

I support the NSNS project as an important scientific endeavor, as an opportunity for Oak Ridge National Laboratory to maintain its world-class ranking in this field of research, and as a significant economic activity that will benefit Oak Ridge and the surrounding communities for many years into the future. Siting of the NSNS within the Oak Ridge Reservation (ORR) is consistent with the purpose and mission of the ORR.

RESPONSE

DOE appreciates the comment.

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COMMENT CODE

P-3-2

I am concerned that the preferred location for the NSNS on Chestnut Ridge -- at the center of the National Environmental Research Park and the Southern Appalachian Biosphere Reserve -- together with the planned location of the Joint Institute for Neutron Science, will significantly contribute to the increasing forest fragmentation in this nationally and internationally important habitat for rare and endangered species.

RESPONSE

The selection of the Chestnut Ridge site for construction of the SNS at ORNL is discussed in Appendix B of the DEIS. DOE agrees that removal of the trees on the Chestnut Ridge site would contribute to forest fragmentation; however, the area around the proposed site would remain forested. Construction plans call for a minimum of forest clearing, which would help minimize the fragmentation effects of clear cutting. The 110-acre site represents less than one-half percent of the total forested area on the ORR (see Section 5.2.5.1 of the EIS).

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COMMENT CODE

P-3-3

I am also concerned about likely and possible impacts of the NSNS on long-term research projects that have been collecting scientific data on the forest and stream ecosystems in the Walker Branch watershed for three decades.

RESPONSE

The potential effects of the proposed action on NOAA monitoring and ORNL-ESD ecological research projects in the Walker Branch Watershed are assessed in Sections 5.2.8.1.1, 5.2.8.2.1, 5.7.1.8.1, 5.7.1.8.2 and 5.8.1 of the FEIS. If the ORR site is selected for the SNS, DOE is committed to preparation of a formal mitigation action plan to address these effects. In the mitigation action plan, DOE will identify potential mitigation measures and evaluate them for effectiveness. The measures to be evaluated would include heating the proposed SNS with electric heat pumps or heat recovered from the SNS cooling system instead of the currently proposed natural gas boilers. Such measures could mitigate the effects of CO₂ emissions from SNS operations. To further mitigate the effects from CO₂ emissions, DOE would also evaluate the use of electric or ultra-low-emission vehicles to transport workers to the SNS site from remote parking lots. These evaluations would also include relocating the current NOAA/ATDD monitoring tower to a new location less susceptible to CO₂ and water vapor emissions from the proposed SNS or construction of a new tower at this new location. Based on the results of its evaluations, DOE will select and commit to the implementation of particular mitigation measures in the mitigation action plan. The mitigation action plan will be completed after publication of the Record of Decision and prior to construction of the proposed SNS.

In accordance with 10 CFR 1021.311, DOE will make copies of the mitigation action plan available for public inspection in the DOE reading room in Oak Ridge (refer to Section 1.4 of this FEIS), and copies will also be available upon written request to DOE. In addition, DOE plans on holding public information meetings concerning the SNS project after publication of the Record of Decision and before the beginning of SNS construction. One of these meetings will include an opportunity for public

comment on the contents of the mitigation action plan. The time, location, and agenda for such meetings will be announced through the normal public communications practices of DOE-ORO.

LOCATION OF EIS REVISION(S): Sections 1.4.4 and 5.2.8.1.1

COMMENT CODE

P-3-4

The draft EIS fails to adequately address cumulative impacts on the ORR and in particular on its biodiversity. It does not even include in its assessment such major impacts from the immediate past and from present activities as the development of the ED1 parcel. Indeed, the document's discussion of cumulative impacts is essentially limited to the construction and operational phases of the NSNS project, and its anticipated future expansion. Thus this EIS does not meet the requirements detailed in 40 CFR 1508.7 of assessing cumulative impacts, which requires the inclusion of "other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."

RESPONSE

When discussing the potential impacts of construction of the SNS, DOE assessed the impacts against "background" conditions or the existing conditions taking into account past and present activities at each of the potential sites. Discussions in Section 5.7, Cumulative Impacts, center on the potential effects of reasonably foreseeable future actions in conjunction with the potential effects of SNS construction. The discussion for ORNL specifically included Parcel ED-1. Section 5.7.1.5.1 indicates that development of Parcel ED-1 would require clearing of approximately 500 acres of land. The potential impacts are judged to be minimal because the total acreage of forest on the ORR would be reduced by approximately 2.5 percent. This reduction includes land cleared for Parcel ED-1, the CERCLA Waste Disposal Facility, the Joint Institute for Neutron Science, and the SNS.

COMMENT CODE

P-3-5

Also, the draft EIS does not assess in sufficient detail mitigation measures that might be taken to minimize the environmental impacts of the NSNS, such as DOE long-term commitments to preserving the integrity of the National Environmental Research Park and alternative technologies for cooling the NSNS.

RESPONSE

The potential effects of the proposed action on NOAA monitoring and ORNL-ESD ecological research projects in the Walker Branch Watershed are assessed in Sections 5.2.8.1.1, 5.2.8.2.1, 5.7.1.8.1, 5.7.1.8.2 and 5.8.1 of the FEIS. If the ORR site is selected for the SNS, DOE is committed to preparation of a formal mitigation action plan to address these effects. In the mitigation action plan, DOE will identify potential mitigation measures and evaluate them for effectiveness. The measures to be evaluated would include heating the proposed SNS with electric heat pumps or heat recovered from the SNS cooling system instead of the currently proposed natural gas boilers. Such measures could mitigate the effects of CO₂ emissions from SNS operations. To further mitigate the effects from CO₂ emissions, DOE would also evaluate the use of electric or ultra-low-emission vehicles to transport workers to the SNS site from remote parking lots. These evaluations would also include relocating the current NOAA/ATDD monitoring tower to a new location less susceptible to CO₂ and water vapor emissions from the proposed SNS or construction of a new tower at this new location. Based on the results of its evaluations, DOE will select and commit to the implementation of particular mitigation measures in the mitigation action plan. The mitigation action plan will be completed after publication of the Record of Decision and prior to construction of the proposed SNS.

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LOCATION OF EIS REVISION(S): Sections 1.4.4 and 5.2.8.1.1

COMMENT CODE

P-3-6

-involve local stakeholders in the design and analysis of mitigation measures

RESPONSE

DOE does plan on holding additional public information meetings concerning the SNS project after publication of the Record of Decision. The time, location, and agenda for these meetings will be announced through normal public communication processes at the site selected in the Record of Decision. DOE will solicit input from local stakeholders concerning various aspects of the project, including proposed mitigation measures.

COMMENT CODE

P-3-7

-hold another, well-publicized, public comment period and hearings on the FEIS before decisions on the final design of the SNS are made and any construction begins.

RESPONSE

DOE does plan on holding additional public information meetings concerning the SNS project after publication of the Record of Decision and before construction begins. The time, location, and agenda for these meetings will be announced through normal public communication processes at the site selected in the Record of Decision.

COMMENT CODE

P-3-8

I also ask you to extend the comment period for the draft EIS because I know of several organizations that have not had enough time to study this document and to come to a decision about their responses.

RESPONSE

While DOE did grant specific requests to extend comment receipt, there were so few of these (2) that a general extension was not considered necessary or warranted. DOE incorporated comments received after the close of the formal comment period to the extent possible, preceding the printing of the FEIS.

COMMENT CODE

P-4-1

I support the selection of the Preferred Alternative; locate the SNS in Oak Ridge to be operated by the ORNL. I recognize the importance of the research the SNS enables.

RESPONSE

DOE appreciates the comment.

COMMENT CODE

P-4-2

The draft EIS does a good job of documenting the concerns and issues raised at the scoping meeting -- except for one -- the lack of public involvement in selecting the actual, physical site. The draft EIS and associated public meetings are the first such opportunity since then. An informal, interactive work session earlier in the process would have been desirable. Unfortunately it may now be too late in the process to affect the outcome for actual adjustment of the site.

RESPONSE

The siting of the proposed SNS facility was determined based upon a site selection process that is presented in Appendix B of the DEIS. The site selection process included an evaluation of several potential sites within the ORR. DOE has held additional public information meetings concerning the SNS project and will continue to do so. The time, location, and agenda for these meetings will be announced through normal public communication processes at the site selected in the Record of Decision.

COMMENT CODE

P-4-3

The document does NOT give all the environmental impacts. The site plan shown on page 3-12 and elsewhere does not show the retention basin. This basin is discussed on pages 5-20, 21, 30 and elsewhere but its size and location are never given.

RESPONSE

The retention basin is not shown on the site plan (Figure 3.2.1.5-1) on page 3-12 because it is meant to show a generic site plan illustrating the facility. The placement of a retention basin is site specific and will vary in location according to the site. The figures showing the specific SNS site location for each of the four alternative locations have been modified to include the retention basin. The text of the EIS

concerning the retention basin has been clarified. At the Conceptual Design stage of the project, the size of the retention basin required was approximated at 2 acres.

LOCATION OF EIS REVISION(S): Figures 4.1-1, 4.2-1, 4.3-1, and 4.4-1; Sections 3.2.2.3, 3.2.3.6, 5.2.2.1.2, 5.2.5.2, 5.3.2.1, 5.3.5.2, 5.4.2.1, 5.4.5.3, 5.5.2.1, 5.5.5.2, 5.8.1, 5.8.2, 5.8.3, 5.8.4, 5.11.1, and 5.11.3

.....
COMMENT CODE

P-4-4

Page 5-37, last paragraph mentions construction of improvement of utility corridors and a southwest access road not assessed at the time of the draft EIS; these should be included in the final EIS and not just for cultural resources.

RESPONSE

The CEQ regulations (40 CFR 1501.2) require integration of the NEPA process with other planning for proposed actions "...at the earliest possible time..." In the DOE system, this means that an EIS is typically initiated during the Conceptual Design phase of a proposed action. This is a most general level of design. The full details of a proposed action are not generally established until the completion of Title I and Title II (preliminary and detailed) design at a later date.

This EIS was initiated during the Conceptual Design phase of the SNS project. Title I and II design for the project have not been completed. As a result, all of the final design details for the proposed SNS have not been established. For example, the final routes of access roads and utility corridors to the proposed SNS sites at the four national laboratories are not fully known. In addition, the final locations of the retention basin are uncertain. Consequently, the potential effects of construction and operation of these utility corridors and retention basin on the environment are considered to be within the bounds of the overall site assessment in this EIS.

The locations of the retention basin, roads, and utility corridors would be firmly established at the host national laboratory after publication of the Record of Decision. To the maximum extent possible, these areas would be established to avoid effects on sensitive environmental features such as cultural resources, wetlands, and natural areas. In addition, the potential effects of the proposed action on the environment in these areas would be assessed. DOE will prepare a Mitigation Action Plan to explain how and when mitigation measures would be implemented and how DOE would monitor the mitigation measures over time to ensure their effectiveness. The assessment and mitigation measures would be implemented prior to the initiation of ground-disturbing activities at these locations.

LOCATION OF EIS REVISION(S): Chapter 5 (Introduction)

.....
COMMENT CODE

P-4-5

The EIS does not do a good job of showing the intrusion of the SNS into environmentally sensitive areas in a way the public can easily see. In contrast, for example, the CERCLA Waste Disposal RI/FS (DOE/OR/02-1637&D2 in figures 7.2, 7.3 and 7.4) show in detail, the sensitive areas and the proximity to the candidate sites. I have used these in studying the SNS site. The inclusion of a figure similar to Figure 7.4 in section 4.1.5 or 5.2.5.4, along with the figure found on page B43 of this document, is recommended.

RESPONSE

An additional figure showing environmentally sensitive areas on and adjacent to the proposed SNS site has been included in the FEIS. The other figure mentioned by the commenter is considered to already be part of the EIS (Volume II, Appendix B, page B-43). This figure shows BSR areas relative to the proposed SNS site on the ORR. A new paragraph referring the reader to these figures has been included in the text of the FEIS.

LOCATION OF EIS REVISION(S): Section 4.1.5.4, Figure 4.1.5.4-2 (new)

.....
COMMENT CODE

P-4-6

In addition, an outline of the SNS footprint should be shown on Figures 4.1.5.4-1 and 4.1.5.4-2.

RESPONSE

Figures 4.1.5.4-1 and 4.1.5.4-3 (renumbered) have been revised to include an outline of the SNS footprint.

LOCATION OF EIS REVISION(S): Figures 4.1.5.4-1 and 4.1.5.4-3 (renumbered)

.....
COMMENT CODE

P-4-7

Figures 4.1.8.3-1 and 4.1.8.3-2, found on pages 4-54 and 4-55 are not readable; an expanded view of the affected area would be an improvement.

RESPONSE

The base map for Figure 4.1.8.3-1 was originally done in multiple colors. It was translated into a black and white format for use in the DEIS. Prior to issuance of the draft document, several attempts to improve the quality of this figure were undertaken with limited success. However, the relationship of the BSR areas to the proposed SNS site is shown in another figure in the EIS. This figure, which provides an expanded view of the affected area, is in Volume II, Appendix B, page B-43.

An attempt has been made to improve the quality of Figure 4.1.8.3-2, particularly on the legend bars.

LOCATION OF EIS REVISION(S): Figure 4.1.8.3-2 (renumbered as Figure 4.1.5.4-3)

.....
COMMENT CODE

P-4-8

The Draft EIS also does a good job of stating the impact of the SNS on the research being done in the Walker Branch Watershed. The work being done here is very important to the Nations Global Change Program. It is extremely important to mitigate such impacts. For example, in addition to the potential replacement of natural gas boilers with electric heat pumps mentioned on page 5-41, the use of an electric shuttle bus to transport people to the site during the operations period would reduce both runoff by eliminating the need for parking lots as well reducing carbon dioxide emissions from conventional vehicles.

RESPONSE

The potential effects of the proposed action on NOAA monitoring and ORNL-ESD ecological research projects in the Walker Branch Watershed are assessed in Sections 5.2.8.1.1, 5.2.8.2.1, 5.7.1.8.1, 5.7.1.8.2

and 5.8.1 if the FEIS. If the ORR site is selected for the SNS, DOE is committed to preparation of a formal mitigation action plan to address these effects. In the mitigation action plan, DOE will identify potential mitigation measures and evaluate them for effectiveness. The measures to be evaluated would include heating the proposed SNS with electric heat pumps or heat recovered from the SNS cooling system instead of the currently proposed natural gas boilers. Such measures could mitigate the effects of CO₂ emissions from SNS operations. To further mitigate the effects from CO₂ emissions, DOE would also evaluate the use of electric or ultra-low-emission vehicles to transport workers to the SNS site from remote parking lots. These evaluations would also include relocating the current NOAA/ATDD monitoring tower to a new location less susceptible to CO₂ and water vapor emissions from the proposed SNS or construction of a new tower at this new location. Based on the results of its evaluations, DOE will select and commit to the implementation of particular mitigation measures in the mitigation action plan. The mitigation action plan will be completed after publication of the Record of Decision and prior to construction of the proposed SNS.

In accordance with 10 CFR 1021.311, DOE will make copies of the mitigation action plan available for public inspection in the DOE reading room in Oak Ridge (refer to Section 1.4 of this FEIS), and copies will also be available upon written request to DOE. In addition, DOE plans on holding public information meetings concerning the SNS project after publication of the Record of Decision and before the beginning of SNS construction. One of these meetings will include an opportunity for public comment on the contents of the mitigation action plan. The time, location, and agenda for such meetings will be announced through the normal public communications practices of DOE-ORO.

LOCATION OF EIS REVISION(S): Sections 1.4.4 and 5.2.8.1.1

.....
COMMENT CODE

P-4-9

There needs to be a COMMITMENT to mitigation measures BEFORE construction begins!

RESPONSE

DOE is committed to the identification and implementation of appropriate mitigation measures prior to the beginning of construction on the proposed SNS at the site selected in the Record of Decision. DOE will prepare a Mitigation Action Plan for the selected site (see Sections S 1.4.4 and 1.4.3).

.....
COMMENT CODE

P-4-10

A better decommissioning plan is needed. Page 5-43 (2nd paragraph) states: "Current plans call for in-situ decommissioning of the SNS when its operational life cycle is completed." This is unacceptable. Is a 30 year operational life (page 5-19) realistic?

RESPONSE

DOE will prepare a decommissioning plan for the SNS at the selected site after release of the Record of Decision and before the start of construction. This plan will include estimates of the amount of scrap and wastes that would be generated during decommissioning of the facility. At present, DOE estimates the cost of decommissioning the facility to be 150 million dollars (year 2006 dollars) (Spallation Neutron Source Project Execution Plan; SNS/97-1). DOE has also committed to prepare the appropriate NEPA documentation prior to decommissioning the facility.

The SNS is being designed to operate for 40 years beginning in 2006. DOE estimates that the facility will be producing neutrons for scientific research approximately 75 percent of this time, or 30 years. Thus, 30 years was used in the DEIS to determine the amount of activation products produced. Advances in design and technology over the next 46 years may allow the life of the facility to be extended past 40 years, provided there is a continued need for the facility.

COMMENT CODE

P-4-11

1. Page 4-19 (3rd paragraph) states that one wetland area in the area of BCV south tributary 4 will be affected. However Table 4.1.5.2-1 and Figure 4.1.5.2-1 show BCST2.

RESPONSE

The paragraph identified in the comment is not intended to indicate that wetland BCST2 would be affected by the proposed action or the no-action alternative. This paragraph simply identifies the wetlands in the vicinity of the proposed SNS site at ORNL. The wording "...Bear Creek south tributary 4..." in the DEIS has been changed to read "...Bear Creek south tributary 2..."

LOCATION OF EIS REVISION(S): Section 4.1.5.2

COMMENT CODE

P-4-12

2. On page 5-48 in the 2nd paragraph of the 2nd column the annual dose to members of the public, inside and outside the controlled area appear to be reversed.

RESPONSE

The dose limits are correct as stated. The SNS shielding policy is based on the requirements of 10 CFR 835 and is intended to simplify radiation monitoring of individuals at the facility. The dose to members of the public is limited to 100 mrem/yr both inside and outside the controlled area; however, 10 CFR 835.402(a)(3) and 835.402(c)(3) require individual radiation monitoring for minors and members of the public inside the controlled area that would be likely to receive external or internal exposures of 50 percent of the annual limit. By limiting potential exposure to such individuals to no more than 50 mrem/yr, the SNS shielding policy eliminates the need to issue individual radiation monitors to visitors. Such monitors are not required for individuals outside the controlled area.

COMMENT CODE

P-4-13

3. On page 5-38 in the 1st column, 40RE488 is discussed in both prehistoric and historic resource section, there appears to be an error.

RESPONSE

Sections 5.2.7.1 and 5.2.7.2 are not in error, but the comment indicates the need for some clarification of the DEIS text. This need for clarification rests on the meaning of the term "component," as it is typically used in American archaeology.

Many archaeological sites contain the separate and distinctive material remains of occupations by different cultural groups. Each of these occupations may be associated with a particular period in time, and the individual occupations may be separated from each other in time by thousands of years. In

American archaeology, each culturally and temporally distinctive occupation of a single site is referred to as a component. One archaeological site may have a single component, but another may have numerous components. Sites with more than one component are referred to as multicomponent sites. Site 40RE488 is a multicomponent site. It contains archaeological remains indicative of a prehistoric occupation, and it was also the site of a late 19th or early 20th century Anglo-American occupation. Thus, in the DEIS, potential effects on the prehistoric component at this site are appropriately assessed under Section 5.2.7.1, Prehistoric Resources, and potential effects on the Anglo-American component are appropriately assessed under Section 5.2.7.2, Historic Resources.

The text of the DEIS has been revised to more clearly indicate that 40RE488 has both a prehistoric component and a historic component. This includes the insertion of an explanatory text box in Chapter 5.

LOCATION OF EIS REVISION(S): Sections 4.1.7.2; 5.2.7.1 and 5.2.7.2 (new text box)

.....
COMMENT CODE

P-4-14

4. On page 4-5 the figure is mislabeled, it should be 4.1.1.1-3 (as referenced on page 4-7). In addition, the four borings discussed should be identified.

RESPONSE

The incorrect figure number on page 4-5 in the DEIS has been changed to Figure 4.1.1.1-3. The boreholes discussed in Section 4.1.1.4 are B-1, B-5, B-8, and B-11. These boreholes have been identified in the text.

LOCATION OF EIS REVISION(S): Sections 4.1.1.1 and 4.1.1.4

.....
COMMENT CODE

P-4-15

5. Figures 1 and 2 in Appendix B are unreadable.

RESPONSE

Figures 1 and 2 in Appendix B of the EIS are part of a separate report on selection of the proposed site for the SNS at ORNL. The full text of this report is included in the EIS to document how this site was selected. In the original report, Figures 1 and 2 are highly complex color maps with subtle gradations in color from one area to another. Such maps are not very amenable to the reproduction of detail in the black and white format chosen for this EIS. Nonetheless, DOE believes it is necessary to include this report in the EIS. The color versions of these maps are available for public inspection and use in the DOE Reading Rooms. The locations of the reading rooms are provided in Volume 1, Section 1.5, page 1-17 of the EIS.

.....
COMMENT CODE

P-5-1

page 5-45 (Table S1.5.2-1) 9b. BNL Alternative

I believe 3.4 mrem is 34% of limit (not 3.4%).

RESPONSE

The commenter is correct. The 3.4% mrem figure has been changed to 34%.

LOCATION OF EIS REVISION(S): Table S 1.5.2-1, 9b – BNL Alternative, Table 3.5-1, 9b—
BNL Alternative

.....
COMMENT CODE

P-5-2

page 1-3 1st paragraph - it states that cold n° are slower than thermal n°; yet, the energies listed state otherwise. Units correct?

RESPONSE

The commenter is correct. The electron volts for thermal and cold neutrons have been corrected.

LOCATION OF EIS REVISION(S): Section 1.1

.....
COMMENT CODE

P-6-1

Hello, My name is Bonnie Bonneau, I'm on your list. I'm at Box 351, El Prado, NM. I have been pretty busy, but I am real concerned about this issue and I don't think you should make one of those neutron, spallation source, facilities at all, it sounds really dangerous. I was really impressed with your catalogue accident scenarios, but of course I suspect there is probably one where something could really go wrong and people could really get hurt.

RESPONSE

DOE shares the commenter's concern for human safety issues potentially associated with the proposed construction and operation of the SNS. As a reflection of this concern, DOE considered a full range of accident scenarios in the DEIS, including those that realistically could occur and those with a very low mathematical probability of occurrence. This represented a conscientious attempt to identify and analyze that one accident "...where something could go wrong and people could really get hurt." It should also be noted that DOE plans to perform additional, highly detailed analyses of facility safety prior to construction and operation of the proposed SNS. More information on these planned analyses is provided in the response to Comment P-2-3.

.....
COMMENT CODE

P-6-2

I don't like this accident, it makes a whole lot more of poisonous wastes that we don't have any way to deal with.

RESPONSE

As indicated in Sections 5.2.11, 5.3.11, 5.4.11, and 5.5.11 of this FEIS, DOE has the capacity to safely and effectively manage SNS-generated wastes in compliance with applicable federal and state environmental regulations for the foreseeable future. The issue of securing technology for the safe, long-term management of radioactive wastes from DOE facilities in general is beyond the scope of this EIS.

.....
COMMENT CODE

P-6-3

I don't like the notion that where, the page you said that you wanted it set in bedrock, but karst would do, or you would maybe even put it, that was on page B-81, you would even put it at Los Alamos where there is not even karst, there is something called tuff which is a bunch of volcanic ash, and so putting it at Los Alamos is totally outrageous.

RESPONSE

The site-selection report for LANL is in Appendix B of the FEIS. Table 1 on page B-69 in this report indicates that the rock underlying the proposed SNS site in TA-70 has been determined to be an adequate substrate for the SNS facilities. This rock is the tuff mentioned by the commenter (refer to Section 4.2.1.1 of the FEIS). The stability of this rock for construction of the proposed SNS is further underscored by the discussion in Section 4.2.1.4.

COMMENT CODE

P-6-4

Putting it anywhere near a water table would be total ridiculous. And, you know, I don't like all that money.

RESPONSE

The commenter's concern for the potential effects of the proposed SNS on groundwater is shared by DOE. In making its decision on a final site for the proposed SNS, DOE will consider the proximity of the alternative sites to the water table, the potential for groundwater effects at these sites, and the potential implementation of technologies that can prevent or significantly limit effects on groundwater. Information pertinent to these decision factors is provided in Chapters 3, 4, and 5 of the FEIS.

COMMENT CODE

P-6-5

But I have also say that your section of cumulative impacts is a terrifically sad understatement. Because a cumulative impact have to do with taking food from children, you know, depriving parts of our economy that really need help to do a bunch of weird stuff that is very dangerous. And, you know, not as useful as making sure children get decent nutrition and good educations. And I don't like, I think you are making a new generation of weapons, with a neutron bomb. I think you are trying to make a new generation of warfare, that you refuse to be nice to people and you just have this attitude of wanting to kill more and more and I think it is a bad way to go and I hope you hang it up and give up this project and all the ways of war. Thank you so much, good bye.

RESPONSE

The social issues mentioned in the comment are beyond the scope of this EIS.

COMMENT CODE

H-1-1

17 BARBARA WALTON: Okay. The main deficiency I found

18 in the E.I.S. was it spoke of a retention basin, but it never

19 showed it in the site plan. And it never said how big it was

20 and whether it would fit in the footprint, and I would like

21 to -- and I did notice in this color document, which I saw

22 for the first time today, something that might be the

23 retention basin.

24 Could you speak to the retention basin and just

25 maybe answer some of my questions about the retention basin?

11 BARBARA WALTON: How will we find out the impacts

12 of that then if it's not -- will it be in the Final E.I.S.?

17 BARBARA WALTON: This is the first I heard about a

18 retention basin. How big is it?

18 The document then does not give all the

19 environmental impacts because it does not include the

20 retention basin.

21 Now, I got this as I walked in, and there appears

22 to be a basin on the last document. I don't know whether the

23 size is representative on this picture. I do know that it is

24 located outside the footprint that was given in the E.I.S.

RESPONSE

The text of the EIS concerning the retention basin has been clarified. At the Conceptual Design stage, the size of the retention basin required was approximated at 2 acres. The approximate location of the retention basin has been added to the figures showing the SNS site location for each of the four alternative locations. The siting of the retention basin will occur after release of the Record of Decision and before the start of construction, during the Title I or Title II Design stage.

LOCATION OF EIS REVISION(S): Figures 4.1-1, 4.2-1, 4.3-1, and 4.4-1; Sections 3.2.2.3, 3.2.3.6, 5.2.2.1.2, 5.2.5.2, 5.3.2.1, 5.3.5.2, 5.4.2.1, 5.4.5.3, 5.5.2.1, 5.5.5.2, 5.8.1, 5.8.2, 5.8.3, 5.8.4, 5.11.1 and 5.11.3

COMMENT CODE

H-1-2

7 BARBARA WALTON: I would like to start by saying

8 that I agree with the need and the importance of the research

9 that will be performed by the S.N.S. And I support the

10 selection of the preferred alternative to locate it in Oak

11 Ridge.

RESPONSE

DOE appreciates the comment.

.....
COMMENT CODE

H-1-3

12 I also would state that the Draft E.I.S. again does

13 a good job of documenting the concerns and issues raised at

14 the scoping meeting except for one, which is the lack of

15 public involvement in selecting the actual, physical site.

24 There appear to me that there might be some other

25 locations on Chestnut Ridge that might be better, but -- I

1 would like to see an opportunity for the public to better

2 understand this site and whether or not there might be a site

3 less environmental and research impacted -- impact less

4 areas.

18 and a commitment to involve the public. ...

RESPONSE

The siting of the proposed SNS facility was determined based upon a site selection process that is presented in Appendix B of the DEIS. The site selection process included an evaluation of several potential sites within the ORR. DOE has held additional public information meetings concerning the SNS project and will continue to do so. The time, location, and agenda for these meetings will be announced through normal public communication processes at the site selected in the Record of Decision.

.....
COMMENT CODE

H-1-4

5 ... The other thing that really concerned me in

6 addition to the impact of the research areas at Walker

7 Branch. Now, I want to make a statement about that because I

8 recognize the importance of that research.

Appendix A

13 This is very important research that's
14 being done at Walker Branch. So I am very much concerned
15 about it.

RESPONSE

DOE shares the commenter's concern for the potential effects the proposed SNS may have on long-term research projects in the Walker Branch Watershed on the ORR. These projects are described in Section 4.1.8.2, Section 4.1.8.3, and Appendix F of the EIS. The potential effects of the proposed action on short-term and long-term research projects in the Walker Branch Watershed are described in Sections 5.2.8.1.1, 5.2.8.2.1, 5.7.1.8.1, 5.7.1.8.2, and 5.8.1.

If the ORR site is selected for the SNS, DOE is committed to preparation of a formal mitigation action plan to address these effects. In the mitigation action plan, DOE will identify potential mitigation measures and evaluate them for effectiveness. The measures to be evaluated would include heating the proposed SNS with electric heat pumps or heat recovered from the SNS cooling system instead of the currently proposed natural gas boilers. Such measures could mitigate the effects of CO₂ emissions from SNS operations. To further mitigate the effects from CO₂ emissions, DOE would also evaluate the use of electric or ultra-low-emission vehicles to transport workers to the SNS site from remote parking lots. These evaluations would also include relocating the current NOAA/ATDD monitoring tower to a new location less susceptible to CO₂ and water vapor emissions from the proposed SNS or construction of a new tower at this new location. Based on the results of its evaluations, DOE will select and commit to the implementation of particular mitigation measures in the mitigation action plan. The mitigation action plan will be completed after publication of the Record of Decision and prior to construction of the proposed SNS.

In accordance with 10 CFR 1021.311, DOE will make copies of the mitigation action plan available for public inspection in the DOE reading room in Oak Ridge (refer to Section 1.4 of this FEIS), and copies will also be available upon written request to DOE. In addition, DOE plans on holding public information meetings concerning the SNS project after publication of the Record of Decision and before the beginning of SNS construction. One of these meetings will include an opportunity for public comment on the contents of the mitigation action plan. The time, location, and agenda for such meetings will be announced through the normal public communications practices of DOE-ORO.

LOCATION OF EIS REVISION(S): Sections 1.4.4 and 5.2.8.1.1

COMMENT CODE

H-1-5

16 I got a little bit angry about one thing. And that
17 is there appeared to be no commitment in the E.I.S. to
18 mitigation. I mean, the words were there occasionally. Some
19 mitigation measures were even mentioned in some areas, but
20 there was no commitment to mitigation. And I think it's

21 absolutely essential. I think the public needs to be
22 involved. There needs to be a mitigation plan before
23 construction begins.

17 And I would like to see a commitment to mitigation

1 We certainly also want to mitigate any impact on
2 research being done in the Walker Branch area. For example,
3 the cooling towers for gas fire. It did mention that you
4 might be able to use heat pumps. Well, there should be a
5 commitment to that if that's necessary.

10 Well, I say make your parking lot down below and
11 use an electric bus to transport people to and from so that
12 you can avoid the exhaust fumes once it's occupational. You
13 probably can't do that during the construction phase.

14 But anything that you can do to mitigate should be
15 done. And if you involve the public in helping to prepare a
16 mitigation plan prior to construction beginning you will have
17 a better facility. There will be less clean up needed in the
18 future.

RESPONSE

The potential effects of the proposed action on NOAA monitoring and ORNL-ESD ecological research projects in the Walker Branch Watershed are assessed in Sections 5.2.8.1.1, 5.2.8.2.1, 5.7.1.8.1, 5.7.1.8.2 and 5.8.1 of the FEIS. If the ORR site is selected for the SNS, DOE is committed to preparation of a formal mitigation action plan to address these effects. In the mitigation action plan, DOE will identify potential mitigation measures and evaluate them for effectiveness. The measures to be evaluated would include heating the proposed SNS with electric heat pumps or heat recovered from the SNS cooling system instead of the currently proposed natural gas boilers. Such measures could mitigate the effects of CO₂ emissions from SNS operations. To further mitigate the effects from CO₂ emissions, DOE would also evaluate the use of electric or ultra-low-emission vehicles to transport workers to the SNS site from remote parking lots. These evaluations would also include relocating the current NOAA/ATDD monitoring tower to a new location less susceptible to CO₂ and water vapor emissions from the proposed SNS or construction of a new tower at this new location. Based on the results of its evaluations, DOE will select and commit to the implementation of particular mitigation measures in the mitigation action

plan. The mitigation action plan will be completed after publication of the Record of Decision and prior to construction of the proposed SNS.

In accordance with 10 CFR 1021.311, DOE will make copies of the mitigation action plan available for public inspection in the DOE reading room in Oak Ridge (refer to Section 1.4 of this FEIS), and copies will also be available upon written request to DOE. In addition, DOE plans on holding public information meetings concerning the SNS project after publication of the Record of Decision and before the beginning of SNS construction. One of these meetings will include an opportunity for public comment on the contents of the mitigation action plan. The time, location, and agenda for such meetings will be announced through the normal public communications practices of DOE-ORO.

LOCATION OF EIS REVISION(S): Sections 1.4.4 and 5.2.8.1.1

COMMENT CODE

H-1-6

3 There must be a better decommissioning plan. On
4 page 554, and the second paragraph states, and this is a
5 direct quote. "Current plans call for in situ
6 decommissioning of the S.N.S. branch operational life cycle
7 is completed."
8 Now, for the purposes of the E.I.S. they used a
9 thirty-year life, operational life. I don't know if that's
10 realistic. It seems to me if you're putting a lot of money
11 into a facility like that it might very well operate longer.
15 ... But I don't
16 know whether that thirty-year life is a reasonable life. And
17 I would like to hear more about that in the Final.

RESPONSE

DOE will prepare a decommissioning plan after release of the Record of Decision and before the start of construction. DOE has also committed to prepare the appropriate NEPA documentation prior to decommissioning the facility.

COMMENT CODE

H-1-7

1 ... They did a very poor job of
2 showing its impact on the environment in a way that the

3 public can understand. Most of the drawings show the whole
4 reservation and are so small you can't see it.
10 And so I've tried to figure out where S.N.S. is by
11 using those maps. That's not asking too much that that kind
12 of map that is used in other decision-making documents be
13 used. And I would like to see those kinds of charts in the
14 final E.I.S. ...
23 using a pristine area and developing a major facility that we
24 avoid as much contamination, as much environmental impact, as
25 possible.

RESPONSE

An additional figure showing environmentally sensitive areas on and adjacent to the proposed SNS site has been included in the FEIS. The other figure mentioned by the commenter is considered to already be part of the EIS (Volume II, Appendix B, page B-43). This figure shows BSR areas relative to the proposed SNS site on the ORR. A new paragraph referring the reader to these figures has been included in the text of the FEIS.

The base map for Figure 4.1.8.3-1 was originally done in multiple colors. It was translated into a black and white format for use in the DEIS. Prior to issuance of the draft document, several attempts to improve the quality of this figure were undertaken with limited success. However, the relationship of the BSR areas to the proposed SNS site is shown in another figure in the EIS. This figure, which provides an expanded view of the affected area, is in Volume II, Appendix B, page B-43.

An attempt has been made to improve the quality of Figure 4.1.8.3-2, particularly on the legend bars.

LOCATION OF EIS REVISION(S): Section 4.1.5.4, Figure 4.1.5.4-2 (new), and Figure 4.1.8.3-2

COMMENT CODE

H-1-8

8 One, I rise to support the S.N.S. project and
9 specifically it's location in Oak Ridge under the auspices of
10 O.R.N.L.
17 Further, I think locating the S.N.S. at Oak Ridge
18 gives it a chance to tie in ...

14 Thank you for the opportunity to present some views
15 on the S.N.S. And, again, as I said in my opening, I rise to
16 support both the S.N.S. project and the location at Oak Ridge
17 under the auspices of Oak Ridge National Lab. Thank you.

RESPONSE

DOE appreciates the comment.

COMMENT CODE

H-1-9

22 Three, I think the socioeconomic aspects of the
23 project should be noted with great importance because the
24 D.O.E. has projected the loss of two thousand jobs in the
25 next five years and five thousand jobs in the five years
1 after that.

5 ... So from socioeconomic points of view this is a much
6 appreciated facility.

RESPONSE

DOE appreciates the comment.

COMMENT CODE

H-1-10

7 Indeed, I am opposing Oak Ridge State of -- the
8 World's first future demonstration plant as the follow-up to
9 this to take off about five thousand construction jobs in
10 five to ten years from now, era.

RESPONSE

DOE appreciates the comment; however, the loss of construction jobs in Oak Ridge is not within the scope of this EIS.

COMMENT CODE

H-1-11

11 I wanted to comment now about the E.I.S. for
12 multiple sites versus having D.O.E. headquarters make the
13 decision to use Oak Ridge, 4.1.

18 But I feel that if headquarters could make the
19 decision on sound technical grounds that Oak Ridge was the
20 preferred location, then there should have been an E.I.S. for
21 Oak Ridge as the site without looking at the other three
22 sites. ...

2 But in this comment I don't think the S.N.S. E.I.S.
3 should be the decision-making basis for Mr. Secretary
4 Richardson, as compared with the acting manager Richardson,
5 of Oak Ridge.

6 But rather D.O.E. headquarters should make the
7 decision Oak Ridge is the preferred site and the
8 Environmental Impact Statement should be limited to Oak Ridge
9 with a brief synopsis of the other three sites without
10 repeating the other three sites and saving at least some
11 money in the preparation of the Final E.I.S.

2 I would like to see in the final analysis the
3 current site that you're looking at and at least one other
4 site for a comparison within the Oak Ridge area.

5 I would suspect perhaps something closer to Bethel
6 Valley Road, which among other things would save on the cost

9 I am concerned that the Oak Ridge Reservation is a
10 prime environmental research area, and you're kind of

Appendix A

11 sticking yourself right in the middle of -- over here of this
12 prime area. ...
16 If we have thirty thousand acres, I'm sure there
17 could be an alternate site that isn't quite as intrusive as
18 what you have in roughly the center of this whole wilderness
19 expanse.

RESPONSE

The site-selection study for the proposed SNS is presented in its entirety in Appendix B of the EIS. The intent of DOE is to select the best location for the proposed SNS based upon certain criteria that are outlined in this study. Based upon these criteria DOE narrowed down their selection of potential sites to the four (ORNL, ANL, LANL, and BNL) identified in the EIS. The purpose of the EIS is to assess the environmental impacts that would result from implementing the proposed action at any of the four alternative sites. This information will enable DOE to make a well-informed location decision, which will be published in the Record of Decision.

.....
COMMENT CODE

H-1-12

15 ... I don't know
16 how much it costs and I would like to get that information if
17 I can to prepare a full in force site E.I.S.

RESPONSE

The cost of preparing the EIS for the SNS will be approximately 2 million dollars.

.....
COMMENT CODE

H-1-13

12 I want to make another comment now, five. I was
13 very pleased to see the very clear graphics on this color
14 photo. Your slides have a dark background which make it hard
15 to see. I hope you will redo the slides, even for tonight's
16 presentation if possible.
20 ... The light
21 background is far superior and I hope you will change some of

22 your documentation as quickly as possible.

RESPONSE

DOE appreciates the comment, however, the brochures that are being referred to are not in the scope of the EIS.

.....
COMMENT CODE

H-1-14

20 In this regard, number seven, regardless of where
21 you put it on the reservation I would like you to add some
22 biological environmental research capability as an adjunct to
23 your facility because it is located, as shown here, so close
24 to the center of the relative wilderness areas.

1 ... But I think for the environmental researchers it would
2 be very helpful to them to have some small buildings
3 supplemental to your facility to be looking at.

RESPONSE

DOE appreciates the comment; however, site-specific biological environmental research is not contained in the programmatic mission of the SNS or the EIS.

.....
COMMENT CODE

H-1-15

4 Eight, do you have -- I know they're talking -- the
5 State of Tennessee is talking of the visitor's house. And I
6 think you showed Joint Institute for Neutron Science --
7 incidentally, where will that be relative to the site?
11 DANIEL AXELROD: I would hope that the JINS will be
12 not only for the visiting scientific community, but also will
13 have a visitor's area as well. We, of course, have a
14 visitor's area at the X-10 historic site, the graphite
15 reactor.

Appendix A

17 ... So I would ask that you --

18 as I may, put in provision for a visitor's facility. It

19 needn't be very large. ...

2 ... I propose the library accessibility to

3 the public at Bethel Valley Road by the pond near the

4 entrance to the laboratory.

8 DANIEL AXELROD: This would also be another useful

9 reason for the visitor facility near the JINS ...

14 So if it turned out to be a multi-function facility

15 that visitors, public information, news media releases, and

16 emergency headquarters, and also visitor control.

RESPONSE

Discussions regarding a visitor center/facility in the area of the Joint Institute for Neutron Science and/or the proposed SNS site have been held. However, at this time nothing has been finalized due to the early state of both projects and attendant uncertainties.

.....
COMMENT CODE

H-1-16

5 This JINS facility with its visitor's facility

6 might also well -- a restaurant or tie in your visitor

7 facility with the overlook to O.R.N.L. ...

RESPONSE

Discussions regarding a visitor center/facility in the area of the Joint Institute for Neutron Science and the proposed SNS site have been held. However, at this time much uncertainty exists for both projects, and because the Joint Institute for Neutron Science is a Tennessee state initiative, DOE cannot appropriately comment on its prospective capabilities. At the appropriate time visitor facilities, including such things as overlooks and restaurants, may be examined.

.....
COMMENT CODE

H-1-17

1 ... but it seems the real

2 problem here is the Walker Springs.

3 What we need is an E.I.S. for Walker Springs,
4 incorporating environmental studies. I'm essentially at the
5 end, but is there something in existence that would allow the
6 prediction of needs, possible interferences with the
7 environmental studies for future time?

8 Now, I'm asking -- well, I'm asking anyone who has
9 a feel. But it would have been better if the designers of
10 S.N.S. could have looked at what's required to maintain the
11 environmental study and not interfere. ...

16 FRED MAIENSCHIN: Is there another Walker Springs
17 that will interfere with the next project to be established?
18 Can we ascertain that in advance?

RESPONSE

The potential effects of the proposed action on NOAA monitoring and ORNL-ESD ecological research projects in the Walker Branch Watershed are assessed in Sections 5.2.8.1.1, 5.2.8.2.1, 5.7.1.8.1, 5.7.1.8.2 and 5.8.1 of the FEIS. If the ORR site is selected for the SNS, DOE is committed to preparation of a formal mitigation action plan to address these effects. In the mitigation action plan, DOE will identify potential mitigation measures and evaluate them for effectiveness. The measures to be evaluated would include heating the proposed SNS with electric heat pumps or heat recovered from the SNS cooling system instead of the currently proposed natural gas boilers. Such measures could mitigate the effects of CO₂ emissions from SNS operations. To further mitigate the effects from CO₂ emissions, DOE would also evaluate the use of electric or ultra-low-emission vehicles to transport workers to the SNS site from remote parking lots. These evaluations would also include relocating the current NOAA/ATDD monitoring tower to a new location less susceptible to CO₂ and water vapor emissions from the proposed SNS or construction of a new tower at this new location. Based on the results of its evaluations, DOE will select and commit to the implementation of particular mitigation measures in the mitigation action plan. The mitigation action plan will be completed after publication of the Record of Decision and prior to construction of the proposed SNS.

In accordance with 10 CFR 1021.311, DOE will make copies of the mitigation action plan available for public inspection in the DOE reading room in Oak Ridge (refer to Section 1.4 of this FEIS), and copies will also be available upon written request to DOE. In addition, DOE plans on holding public information meetings concerning the SNS project after publication of the Record of Decision and before the beginning of SNS construction. One of these meetings will include an opportunity for public comment on the contents of the mitigation action plan. The time, location, and agenda for such meetings will be announced through the normal public communications practices of DOE-ORO.

LOCATION OF EIS REVISION(S): Sections 1.4.4 and 5.2.8.1.1

COMMENT CODE

H-1-18

- 11 If indeed S.N.S. is going to change what happens on
12 Walker Branch because of atmospheric emissions, then I guess
13 I agree with Barbara that the mitigation plan has to be
14 carefully constructed to avoid those kinds of impacts on the
15 Walker Branch watershed and the scientific research that's
16 been going on there for so many years.

RESPONSE

The potential effects of the proposed action on NOAA monitoring and ORNL-ESD ecological research projects in the Walker Branch Watershed are assessed in Sections 5.2.8.1.1, 5.2.8.2.1, 5.7.1.8.1, 5.7.1.8.2 and 5.8.1 if the FEIS. If the ORR site is selected for the SNS, DOE is committed to preparation of a formal mitigation action plan to address these effects. In the mitigation action plan, DOE will identify potential mitigation measures and evaluate them for effectiveness. The measures to be evaluated would include heating the proposed SNS with electric heat pumps or heat recovered from the SNS cooling system instead of the currently proposed natural gas boilers. Such measures could mitigate the effects of CO₂ emissions from SNS operations. To further mitigate the effects from CO₂ emissions, DOE would also evaluate the use of electric or ultra-low-emission vehicles to transport workers to the SNS site from remote parking lots. These evaluations would also include relocating the current NOAA/ATDD monitoring tower to a new location less susceptible to CO₂ and water vapor emissions from the proposed SNS or construction of a new tower at this new location. Based on the results of its evaluations, DOE will select and commit to the implementation of particular mitigation measures in the mitigation action plan. The mitigation action plan will be completed after publication of the Record of Decision and prior to construction of the proposed SNS.

In accordance with 10 CFR 1021.311, DOE will make copies of the mitigation action plan available for public inspection in the DOE reading room in Oak Ridge (refer to Section 1.4 of this FEIS), and copies will also be available upon written request to DOE. In addition, DOE plans on holding public information meetings concerning the SNS project after publication of the Record of Decision and before the beginning of SNS construction. One of these meetings will include an opportunity for public comment on the contents of the mitigation action plan. The time, location, and agenda for such meetings will be announced through the normal public communications practices of DOE-ORO.

LOCATION OF EIS REVISION(S): Sections 1.4.4 and 5.2.8.1.1

COMMENT CODE

H-1-19

- 24 On page S-27, the table that says an estimated
25 total of three hundred thousand curies will be deposited ...

10 It seems to me like these really won't comment on
11 just what that three hundred thousand means and how long it's
12 going to be there and that kind of stuff.

RESPONSE

Table S 1.5.2-1 is meant to merely be a summary outline of the impacts associated with the operation and construction of the proposed SNS. A more detailed assessment of the impacts found on this table, including those on geology and soils (page S-27, 1b), can be found in Sections 5.2.1.3, 5.3.1.3, 5.4.1.3, and 5.5.1.3.

.....
COMMENT CODE

H-1-20

17 And I don't have any prepared comments, but I would like to
18 say that I strongly support location of the Spallation
19 Neutron Source in Oak Ridge.
11 ... And I think you'll find that the Greater Oak
12 Ridge Community has repeatedly expressed its support of the
13 project, and we would like to see it go forward in Oak Ridge.

RESPONSE

DOE appreciates the comment.

.....
COMMENT CODE

H-1-21

20 I'd also like to say that I agree with many of the
21 concerns expressed earlier by Barbara Walton and some of the
22 other members of the audience about the impacts to the
23 research on Walker Branch.
24 We don't want to have to trade off one research
25 project for another. ...

RESPONSE

DOE is in agreement with the conclusion that one important research project on the ORR should not be traded off in favor of another. The agency has no proposed plans to do this. Instead, DOE believes that the potential effects of the proposed action on the research projects in the Walker Branch Watershed can be mitigated to maintain the integrity of these projects.

The potential effects of the proposed action on NOAA monitoring and ORNL-ESD ecological research projects in the Walker Branch Watershed are assessed in Sections 5.2.8.1.1, 5.2.8.2.1, 5.7.1.8.1, 5.7.1.8.2 and 5.8.1 of the FEIS. If the ORR site is selected for the SNS, DOE is committed to preparation of a formal mitigation action plan to address these effects. In the mitigation action plan, DOE will identify potential mitigation measures and evaluate them for effectiveness. The measures to be evaluated would include heating the proposed SNS with electric heat pumps or heat recovered from the SNS cooling system instead of the currently proposed natural gas boilers. Such measures could mitigate the effects of CO₂ emissions from SNS operations. To further mitigate the effects from CO₂ emissions, DOE would also evaluate the use of electric or ultra-low-emission vehicles to transport workers to the SNS site from remote parking lots. These evaluations would also include relocating the current NOAA/ATDD monitoring tower to a new location less susceptible to CO₂ and water vapor emissions from the proposed SNS or construction of a new tower at this new location. Based on the results of its evaluations, DOE will select and commit to the implementation of particular mitigation measures in the mitigation action plan. The mitigation action plan will be completed after publication of the Record of Decision and prior to construction of the proposed SNS.

In accordance with 10 CFR 1021.311, DOE will make copies of the mitigation action plan available for public inspection in the DOE reading room in Oak Ridge (refer to Section 1.4 of this FEIS), and copies will also be available upon written request to DOE. In addition, DOE plans on holding public information meetings concerning the SNS project after publication of the Record of Decision and before the beginning of SNS construction. One of these meetings will include an opportunity for public comment on the contents of the mitigation action plan. The time, location, and agenda for such meetings will be announced through the normal public communications practices of DOE-ORO.

LOCATION OF EIS REVISION(S): Sections 1.4.4 and 5.2.8.1.1

COMMENT CODE

H-1-22

- 2 ... I think that it would
- 3 behoove Oak Ridge to reexamine the site.
- 4 My own background involves geology and land use
- 5 issues. In just a brief examination of a map you can find
- 6 other ridge top sites, particularly to the southeast along
- 7 Chestnut Ridge, that have good access to power and potential
- 8 for decent roadways.
- 9 Maybe they're a little bit farther from Oak Ridge
- 10 National Laboratory, but you're talking about making a
- 11 variety of compromises anyway. And it may be a better

12 compromise to put the facility on a suitable location that is
13 farther away from the lab than to compromise the research
14 going on in Walker Branch.
21 and I don't know whether it's a specific NEPA group or Energy
22 Research Organization coming to the public after significant
23 decisions are apparently already made in Oak Ridge.
24 I think that for big scientific projects like this
25 that are going to be supported by the community because they
1 will be, you will have less controversy if you involve the
2 public early on in decisions; such as, where exactly on the
3 reservation would we propose to locate such a facility.
9 And I would encourage you to take that as a lesson
10 learned for next time. ...

RESPONSE

The siting of the proposed SNS facility was determined based upon a site selection process that is presented in Appendix B of the DEIS. The site selection process included an evaluation of several potential sites within the ORR.

DOE has held additional public information meetings concerning the SNS project and will continue to do so. The time, location, and agenda for these meetings will be announced through normal public communication processes at the site selected in the Record of Decision.

.....
COMMENT CODE

H-1-23

20 DANIEL AXELROD. Mr. Daniel Axelrod. I spoke
21 before. You indicated a .40 mrem, M.E.I., maximally exposed
22 individual, on an annual radiation dose. Could you state
23 what the boundary was for this individual? And is one of the
24 reasons for locating at Chestnut Ridge as compared to closer
25 to Bethel Valley Road to give yourself a buffer space from

Appendix A

1 the radiation point of view?

6 So what was the basis for the M.E.I., maximum

7 exposed individual?

13 DANIEL AXELROD: What amount of time per year and

14 hours per year were you assuming?

20 DANIEL AXELROD: So this accident scenario might be

21 anywhere from eight to forty-eight hours, for example, on the

22 access road?

RESPONSE

A complete analysis of the information found in the Summary on page S-45, Impacts on Human Health, can be found in Section 5.2.9.2.1 and Appendix G of the EIS. In addition, the SNS Shielding Policy, which specifies maximum allowable radiation exposure rates for various areas inside and outside the SNS, can be obtained from the DOE Reading Rooms. The locations of the reading rooms are provided in Volume I, Section 1.5, page 1-17 of the EIS.

.....
COMMENT CODE

H-1-24

25 DANIEL AXELROD: Have you written in operational

1 aspects to clear the road in the event that an accident was

2 determined to be taking place?

RESPONSE

The safety of the SNS facility will be evaluated and documented in accordance with DOE Order 5480.23, SAR, and other related orders. Hazard evaluation and safety analysis will be done under the guidance of DOE-SD-3009-94, Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Safety Analysis Reports. The SAR being prepared for the SNS is required by DOE to address emergency preparedness. Clearing the road during an accident would fall under emergency preparedness and planning. The SAR will document facility compliance with DOE emergency preparedness requirements. The emergency planning provisions for protection of the public and workers will be based upon the SAR hazard evaluations and accident analysis of design-basis and beyond-design-basis accidents.

.....
COMMENT CODE

H-1-25

20 ... On page

21 5-48 -- I don't know if you have a copy of the document

22 convenient -- it's talking about doses to the public again.

23 The second paragraph in the second column, I think
24 maybe the numbers have been reversed. Let me read you the
25 statement. It sounded like they might be backwards.

1 "Under this policy the annual dose to members of
2 public, including site visitors, would not exceed one hundred
3 milligrams outside the control area or fifty milligrams
4 inside the controlled area." I would think you would have
5 higher dosage inside the controlled area than outside.

16 BARBARA WALTON: Well, I would ask in the Final
17 that some clarification be given to statements like that.

RESPONSE

The dose limits are correct as stated. The SNS Shielding Policy is based on the requirements of 10 CFR 835 and is intended to simplify radiation monitoring of individuals at the facility. The dose to members of the public is limited to 100 mrem/yr both inside and outside the controlled area; however, 10 CFR 835.402(a)(3) and 835.402(c)(3) require individual radiation monitoring for minors and members of the public inside the controlled area that would be likely to receive external or internal exposures of 50 percent of the annual limit. By limiting potential exposure to such individuals to no more than 50 mrem/yr, the SNS shielding policy eliminates the need to issue individual radiation monitors to visitors. Such monitors are not required for individuals outside the controlled area.

In addition, for clarification purposes, the SNS Shielding Policy which specifies maximum allowable radiation exposure rates for various areas inside and outside the SNS can be obtained from the DOE Reading Rooms. The locations of the reading rooms are provided in Volume I, Section 1.5, page 1-17 of the EIS.

.....
COMMENT CODE

H-1-26

9 UNKNOWN SPEAKER: Could you give the job title or
10 the functions of the individuals, the other three?

RESPONSE

The job titles and functions of the three individuals representing DOE's interests at the public comment meeting are as follows: Clarence Hickey, functioning in a staff role for environmental matters for the Office of Science; David Bean, prime contractor representative with Enterprise Advisory Services, Inc., responsible for the preparation of the EIS document; and Bill Fleming, subcontractor to Enterprise Advisory Services, Inc., responsible for portions of the preparation of the EIS document.

Appendix A

COMMENT CODE

H-2-1

10 First, I want to say that I and the city council
11 strongly endorse the location of the Spallation Neutron
12 Source in Oak Ridge. I believe we understand the
13 significance and the benefits this project will provide to
14 the community, to the state, and to the nation.
14 The council has previously supported past resolutions
15 in support of the Spallation Neutron Source, and I will read
16 a resolution that I will present for council approval at our
17 next meeting Monday night, February the 1st, ...
19 Now, therefore, be it resolved by the mayor and the
20 councilmen of the City of Oak Ridge that the City of Oak
21 Ridge supports and endorses the Department of Energy's
22 preferred alternative to construct and operate the Spallation
23 Neutron Source at the Oak Ridge National Laboratory.

RESPONSE

DOE appreciates the comment.

.....
COMMENT CODE

H-2-2

15 Second, I want to say that the citizens of this
16 community strongly support the location of the Spallation
17 Neutron Source in Oak Ridge. This was evident in a recent
18 city-wide survey that was conducted in September of 1998
19 where a survey was mailed to every household in the city and
20 it consisted of thirteen questions.
6 So I think I can truly say that the citizens of the community

- 7 strongly support the location of the Spallation Neutron
8 Source in the City of Oak Ridge.

RESPONSE

DOE appreciates the comment.

.....
COMMENT CODE

H-2-3

- 16 I strongly support the need for a Spallation Neutron
17 Source, which I think is a scientific and international need,
18 and I believe that Oak Ridge National Laboratory is an
19 excellent institutional setting for this new facility.

RESPONSE

DOE appreciates the comment.

.....
COMMENT CODE

H-2-4

- 20 What I question is the precise location in the heart
21 of the National Environmental Research Park at the Southern
22 Appalachian biosphere reserve. This is certainly -- I can't
23 see in the draft EIS any reasoning or justification why this
24 facility needs to be presented in the Environmental Research
25 Park.

- 1 I also didn't see any evaluation of alternate sites
2 within the Oak Ridge Reservation that are not in the actual
3 -- or at least not in the middle of the research area, and I
4 would really like to see more information in the final EIS
5 that justifies if there really is no other location that's
6 suitable in Oak Ridge.

*Appendix A***RESPONSE**

The siting of the proposed SNS facility was determined based upon a site selection process that is presented in Appendix B of the DEIS. The study shows how the entire reservations was assessed, using exclusionary criteria, to identify the Chestnut Ridge site as the best alternative.

DOE has held additional public information meetings concerning the SNS project and will continue to do so. The time, location, and agenda for these meetings will be announced through normal public communication processes at the site selected in the Record of Decision.

COMMENT CODE

H-2-5

- 7 And in terms of mitigation, if it should turn out
- 8 that this is the only suitable location for the Spallation
- 9 Neutron Source, mitigations should address concerns of the
- 10 integrity of the National Environmental Research Park.

RESPONSE

The major impact of the proposed action on the National Environmental Research Park involves disturbance of current and planned environmental research projects in the Walker Branch Watershed research area. The potential effects of the proposed action on NOAA monitoring and ORNL-ESD ecological research projects in the Walker Branch Watershed are assessed in Sections 5.2.8.1.1, 5.2.8.2.1, 5.7.1.8.1, 5.7.1.8.2 and 5.8.1 if the FEIS. If the ORR site is selected for the SNS, DOE is committed to preparation of a formal mitigation action plan to address these effects. In the mitigation action plan, DOE will identify potential mitigation measures and evaluate them for effectiveness. The measures to be evaluated would include heating the proposed SNS with electric heat pumps or heat recovered from the SNS cooling system instead of the currently proposed natural gas boilers. Such measures could mitigate the effects of CO₂ emissions from SNS operations. To further mitigate the effects form CO₂ emissions, DOE would also evaluate the use of electric or ultra-low-emission vehicles to transport workers to the SNS site from remote parking lots. These evaluations would also include relocating the current NOAA/ATDD monitoring tower to a new location less susceptible to CO₂ and water vapor emissions from the proposed SNS or construction of a new tower at this new location. Based on the results of its evaluations, DOE will select and commit to the implementation of particular mitigation measures in the mitigation action plan. The mitigation action plan will be completed after publication of the Record of Decision and prior to construction of the proposed SNS.

In accordance with 10 CFR 1021.311, DOE will make copies of the mitigation action plan available for public inspection in the DOE reading room in Oak Ridge (refer to Section 1.4 of this FEIS), and copies will also be available upon written request to DOE. In addition, DOE plans on holding public information meetings concerning the SNS project after publication of the Record of Decision and before the beginning of SNS construction. One of these meetings will include an opportunity for public comment on the contents of the mitigation action plan. The time, location, and agenda for such meetings will be announced through the normal public communications practices of DOE-ORO.

The development and implementation of long-term policies, plans, and procedures to preserve the integrity of the National Environmental Research Park are beyond the scope of this EIS. While DOE remains sensitive to providing reasonable protection for the National Environmental Research Park, it

should be noted that the use of ORR land for primary DOE missions and other DOE programmatic initiatives takes precedence over land use for environmental research, forestry, and wildlife management. The National Environmental Research Park was established to make DOE's land resources available for environmental research but not to impede or prevent the use of ORR land for DOE mission purposes.

LOCATION OF EIS REVISION(S): Sections 1.4.4 and 5.2.8.1.1

COMMENT CODE

H-2-6

11 The draft EIS mentions as one of the problems that
12 this will increase defragmentation of the park, and sort of
13 in the same sense it brushes that under the rug and says,
14 well, there will be a wildlife corridor.

15 A lot of the EIS concentrates on individual species
16 and doesn't look at the reserve as an entity, and its
17 integrity and the designation of it as a biosphere reserve is
18 one indication that this is a national asset and even an
19 international asset.

20 A recent scientific survey by the National
21 Conservancy has identified this as a big, important area
22 because it is the only remaining large unfragmented or
23 moderately unfragmented area within the region valley
24 province that has mature forests, or mixed forests, and large
25 amount of interior forest. So that is an important national
1 mission of the research park, and I don't see that addressed
2 in the draft Environmental Impact Statement.

RESPONSE

Identification of the Chestnut Ridge site for potential construction of the SNS at ORNL is discussed in Appendix B of the DEIS. DOE agrees that removal of the trees on the Chestnut Ridge site would contribute to forest fragmentation. However, the area around the proposed site would remain forested. Construction plans call for a minimum of forest clearing, which would help minimize the fragmentation

effects of clear cutting. The 110-acre site represents less than one-half percent of the total forested area on the ORR (see Section 5.2.5.1 of the FEIS).

COMMENT CODE

H-2-7

3 Also, in terms of addressing human impacts, it
4 doesn't do a good job at looking at past or present and
5 reasonably foreseeable future impacts, which is really a
6 requirement for a good EIS. It treats the accumulative
7 impact as the impact of the construction phase and the
8 operational phase, and it really stops at that without
9 looking into all the other proposals and interests that exist
10 in taking out other chunks of the Oak Ridge Reservation for
11 different purposes. So these future impacts should be looked
12 in their entirety and need to be assessed. ...

RESPONSE

When discussing the potential impacts of construction of the SNS, DOE assessed the impacts against "background" conditions, or the existing conditions taking into account past and present activities at each of the potential sites. The discussion in Section 5.7, Cumulative Impacts, centered on the potential effects of reasonably foreseeable future actions in conjunction with the potential effects of construction of the SNS.

COMMENT CODE

H-3-1

That the City of Oak Ridge supports and endorses the Department of Energy's preferred alternative to construct and operate the Spallation Neutron Source at the Oak Ridge National Laboratory.

RESPONSE

DOE appreciates the comment.

COMMENT CODE

H-4-1

1 But the only reason I wanted to make a
2 comment is because you guys need to have some good
3 kudos, not just people who like to raise Cain ...

2 But anyway, I have been reading a lot of the
3 DOE environmental impact statements, the programmatic
4 and dual access and the SWEIS, and this one, and I
5 would have to say the art of making these documents has
6 really improved, and it's more of a science as well as
7 an art.

8 I enjoyed this particular one because it had
9 a chance to put in details about four different sites,
15 Obviously I'm not a neutron scientist, you don't have
16 to be to be involved in this process, but I was really
17 impressed how in a relatively short time, 18 months,
18 they could put together all the technical stuff and all
19 the things that could go wrong and all that, and they
20 have to use the worst case because that's for planning
21 purposes.

15 So I would have to say that besides the
16 programmatic thing for stockpile stewardship and all,
17 this is the first time I ever saw such a thing in depth
18 for four different places, and not only are we looking
19 at four different sites in four different states, each
20 state, you know, Oak Ridge looked at four different
21 places, four places besides the Chestnut Ridge or
22 whatever it is. Right here at Los Alamos they looked
23 at four different places, and they did other places.
24 So you're talking about 16 or 17 different sites that

25 are being evaluated, and I thought that was impressive.

1 If I were somebody that was going to be
2 living wherever they build it, whether it be Oak Ridge
3 or here or wherever, I would know that somebody did
4 their homework, and they made all these evaluations and
5 all these calculations with worst case and that if
6 everything goes right, and then they figure out all the
7 different things that can go wrong and stuff, ...

19 ... And I appreciate the
20 fact that DOE has spent the time and the money not only
21 on the research but doing all the calculations that
22 show that things can be right and that there shouldn't
23 be too many things that haven't been foreseen.

RESPONSE

DOE appreciates the comment.

.....
COMMENT CODE

H-7-1

19 MR. ZIZEK: My name is Russell Zizek. I'm a
20 homeowner. I live on Kearney Road directly outside this
21 facility, second house outside the facility. Being
22 situated there, I dare to object on record against this
23 project being put in this location. There are several
24 criteria which you mentioned, and I've read them in your
1 vast information here. And it seems like there's a lot
2 of criteria brought up by the Department of Energy that's
3 been either overlooked or ignored. Perhaps you operate
4 by leaving this go 'til after this particular part of the
5 function and then taking a name off the table. However,
6 I would hope that with all of the criteria failing,

7 Argonne would have already been taken off.
8 Brings me to the question I asked myself: Why
9 are we even here? The first criteria: There's a one-
10 mile buffer around the site that's your criteria.
11 There's no way 1500 acres of land, which it states in
12 here somewhere, that Argonne possesses can create a one-
13 mile buffer around any point on the facility. Can't do
14 it.

11 ... And the main thing which makes me wonder why
12 we're here is this, seems to me, total disregard of the
13 DOE's own criteria. I've already stated the one-mile
14 buffer; no way you can meet that. And that's been
15 overlooked. And it seems to me that should have been an
16 initial move to pull Argonne out of the mix.

17 And then later on, there's another, a criteria
18 of 500 meters to any existing occupied structure. Well,
19 I'm not a scientist, but I think 500 meters is 1500 feet.
20 And 1500 feet from the current crossroads of -- I
21 wouldn't say the current crossroads -- from your map
22 showing where this site ends, the northerly portion of
23 the site, is 1300 feet to occupied residents. And I'll
24 even go so far as not to lie to you. It's not occupied
1 right now. In fact, the house is empty because it's been
2 sold. And it's already been rezoned to build thirteen
3 single-family houses there. So, they're gonna be within
4 your 500-meter lower criteria.

6 MR. ZIZEK: 750 feet from the northwest corner
7 of your footprint is where the 115 townhouses, 64
8 condominiums and so forth are located.

9 Kearney Road has three, four houses along it
10 between the forest preserve property and frontage road.
11 And there's a new house built there, which is now in
12 Darien. They get city water, however. There's another
13 street to the west. Ruth Drive has about ten houses.

Appendix A

14 They all have well water. And they're within the same,
15 within the 1500-foot criteria.
16 In addition, between our houses is the forest
17 preserve. And the forest preserve has a designated
18 hiking, riding, recreation pact which is 250 feet only
19 from your fence. And your fence would be maybe, I would
20 guess, 400 feet from the end of this footprint to your
21 new facility. So, it seems like you set up these
22 criteria, and you stumble over them, but you never
23 recognize them. I hope you're gonna recognize them now
24 sometime in the very near future and agree that this
1 shouldn't be built here at Argonne.

RESPONSE

In an attempt to narrow down the selection of candidate sites for the SNS, many of the general criteria were originally established from offsite offices with lack of detailed knowledge of the facilities. The 1-mile buffer zone was one of four general exclusionary criteria that DOE used to identify major suitable DOE facilities during the initial screening process (Appendix B). The definition of a 1-mile buffer zone that DOE used as a requirement for a site was that there be a 1-mile buffer between any portion of the facility and permanent residential areas. The buffer zone could include land other than that, which is owned by the DOE. In their initial alternate site analysis process, ANL was identified as being such a site. The 500-meter buffer criterion was established at a later time when the four candidate sites were evaluating their specific site for locating the SNS facility. Given this 500-meter buffer criteria, along with many others, ANL made their best effort to site the proposed SNS in a location to meet as many of the required criteria as possible in order to determine if this site was a viable choice. Although it is geographically possible to place the facility here and have a mild buffer between it and existing occupied structures, it may not be the optimum choice for locating the SNS facility. This step is part of the process to identify the realities of the situation so that the decision-makers can make a well-informed decision.

COMMENT CODE

H-7-2

15 Another point I object to is the possible
16 contamination of ground water. In your EIS Statement, it
17 says that drinking water is taken not from the upper
18 ground water which is, I believe, 65 feet; and that's the
19 point at which you believe the contamination will get
20 down to. Below that, you don't believe -- again,
21 according to the EIS -- that it will reach the lower
22 level of about 165 feet due to the clay and so forth

23 above it.
24 However, you do state that it's not a hundred
1 percent sure that that won't happen due to the various
2 types of materials in the ground. So, in a way, you're
3 saying it won't happen. But you're saying you can't be
4 sure of that. I drink well water. There's 35 homes -- I
5 live in the area between I-55 and Argonne and between
6 Lemont Road and Cass Avenue. In that area, there's 35
7 original houses, I'll call them. Let's say they're 30
8 years old or better.

RESPONSE

Section 3.2.2.9 presents the shielding design for the linear accelerator and accumulator rings. The design is an engineered earthen berm designed to isolate the activation products generated by the particle beam. In Chapter 5 the potential impacts to groundwater are presented. These impacts are based on very conservative assumptions concerning groundwater travel times, dilution, and levels of radionuclides in the earthen berm. The results of this analysis present a bounding estimate of the potential impacts. This bounding estimate becomes the design goal for Title I and Title II design, that takes place after the publication of the Record of Decision. It is true that DOE can not be absolutely certain at this point that activation products would not reach the deep aquifer. However, if during the investigations of the selected site, it is found that soil conditions and groundwater travel times do not agree with the assumptions used in the EIS, the design of the earthen berm would be modified to assure that the severity of the impacts to groundwater would not be greater than expressed in the FEIS.

A discussion of transport of radionuclides for each of the four alternative sites is presented in Chapter 5 of the DEIS (Sections 5.2.2.3, 5.3.2.3, 5.4.2.3, and 5.5.2.3). Because of the uncertainties in the amount of soil activation products and uncertainties about the groundwater at each of the four sites, these analyses are based on very conservative assumptions. The results of these analyses present what DOE considers to be an upper limit of releases to groundwater. After publication of the Record of Decision, characterization of the selected site would determine if additional design features are necessary to achieve the groundwater protection levels presented in the EIS.

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COMMENT CODE

H-7-3

9 In addition to those houses, there's a project
10 which is going to be located 750 feet from the site of
11 this SNS, which is gonna contain 115 townhouse units, 64
12 condominium units, a hotel, and a gymnasium. They are on
13 Lake Michigan water, as you are. So, I guess as far as
14 the water issue is concerned, they're protected from
15 that. But those of us who have wells, the only way we
16 can get Lake Michigan water is to genuflect in front of

Appendix A

17 the Mayor of Darien and ask him if we can please have
18 some Lake Michigan water. They tried that with Argonne;
19 and Argonne, I guess, told them they would take other
20 ways. And they got it directly from the County. We all
21 would appreciate Argonne using that same maneuverability
22 to get Lake water for us without going through Darien
23 since we are in this no-man's land of water situation.

19 MR. ZIZEK: As far as the water, I quite
20 frankly don't trust the water anymore. I've been buying
21 water in the store for 20 years. Feel like sending the
22 bills to Argonne for that. But the LCF's don't thrill me

RESPONSE

DOE appreciates the comment; however, the issue of obtaining water from Lake Michigan for local residents who have wells is not within the scope of this EIS.

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COMMENT CODE

H-7-4

24 The other impact is on human health. I went
1 through all the tables as comparisons of the different
2 laboratories. And it's shown on one page, "Operation
3 would result in 1.3 LCF's." I don't know what "LCF"
4 meant. But, anyway, it would result in something in the
5 offsite population attributed to the SNS.

6 On the next page, it showed, "Anticipated
7 effects to offsite population would be 1.3 excess LCF's
8 over 40 years." And then it addresses one anticipated
9 accident resulting in 2.1 LCF's. Well, this I read in a
10 summary, and the summary didn't contain the definitions
11 for the acronyms. But then later, I got the full manual,
12 and I discovered "LCF" means latent cancer fatalities.
13 Well, I don't know -- You know, there's a lot of
14 tradeoffs in life. And I imagine the community that you
15 people live in maybe feel this is not a significant
16 number. But I'm sure if you were one of the two LCF's,

17 it would be rather significant.

RESPONSE

Latent cancer fatality (LCF) is the parameter DOE uses in EISs to evaluate and compare the radiological consequences of its proposed actions. LCFs are estimated by applying a dose-to-risk conversion factor to an estimated radiation dose. There are many conservative assumptions, designed to make the assessment as rigorous as possible, involved in the derivation of these conversion factors and in their use in an EIS. As a result, LCF values in an EIS are intended primarily to provide a means of comparing potential radiological consequences of alternative actions evaluated in the EIS (i.e., the alternative sites for the SNS) rather than to predict future events.

Potential radiation exposures from SNS activities are low-dose, low-dose-rate exposures. Scientific studies have yet to establish whether, in fact, such exposures could result in latent cancer fatalities. The dose-to-risk conversion factors for low-dose, low-dose-rate exposures used by DOE have been derived from observations of the consequences of high-dose, high-dose-rate exposures based on conservative assumptions that make it unlikely that consequences would be underestimated. Since it is presently unknown whether there is some threshold dose for induction of latent cancers, dose-to-risk conversion factors are applied based on the assumption that any radiation exposure, no matter how small, could result in latent cancer fatality.

DOE applies dose-to-risk conversion factors to both populations and to individuals. The 1.3 LCFs over 40 years reported for the ANL alternative is equivalent to an average individual cumulative dose of 0.314 mrem (0.008 mrem/yr) to each of the approximately 8.2 million people within 50 miles of the proposed SNS site at ANL. Based on a dose-to-risk conversion factor of 0.0005 LCFs per person-rem, the average individual in the population would have 1 chance in 5,000,000 of dying of cancer as the result of exposure to SNS emissions for 40 years. Under the same conditions, the maximally exposed individual assumed to live at the ANL site boundary would have 1 chance in 5,000 of dying of cancer as the result of exposure to SNS emissions for 40 years. The methods used to estimate the magnitude of these emissions and their movement through the environment are both conservative so that the actual risks are likely to be less.

The maximally exposed individual is a hypothetical member of the public assumed to live at the boundary of the DOE-owned land for 8,760 hours per year and to produce their entire food supply at this location. For the ORNL alternative, this is the boundary of the Oak Ridge Reservation. For the LANL, ANL, and BNL alternatives, this is the boundary of the laboratory.

The off-site population consists of all individuals residing outside the ORR boundary within 50 miles (80 km) of the site and is assumed to be present for 8,760 hr/yr.

The same type of analysis can be applied to the “anticipated” accident with 2.1 LCFs at an SNS power level of 4 MW and would yield similar, but slightly higher, results. Section 5.2.9.3.3 discusses changes in assumptions for the accident scenario that could reduce its probability of occurrence and/or reduce its consequences.

LOCATION OF EIS REVISION(S): Section 5.1.9.4**COMMENT CODE**

H-7-5

23 ... I think it would be enlightening and maybe

Appendix A

24 a little more neighborly if in any future charts of this
1 type, maybe once a page you would spell out what these
2 acronyms mean. A lot of people, they read things -- and
3 especially laymen like myself -- you read something, you
4 don't understand it, you say, "Well, it can't be too
5 bad." It just means something. Inside joke. So, you go
6 over it.

RESPONSE

DOE agrees that the use of acronyms can be confusing. The first time an acronym is used in a chapter of this EIS, it is defined. The definitions of all acronyms used in this EIS can be found in "Acronyms and Abbreviations", beginning on page AACC-1 of the document.

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COMMENT CODE

H-7-6

17 MR. ZIZEK: All right. Thank you for that. I
18 thank you for listening to me. I would also ask, though,
19 in the future -- I discussed with various neighbors in
20 the area. And no one, I don't believe, has received any
21 information on this. Maybe they refused it if they were
22 asked if they wanted it. But I would say a very small
23 portion of the 35, 40 houses in the area received any
24 information on this proposed project. I think it would
1 be far more correct if when Argonne was contemplating
2 anything that would change drastically their operation,
3 that the public around the facility be informed to
4 participate in meetings such as this. If they're not
5 informed, they can't participate.

17 MR. ZIZEK: What I was speaking, though, was
18 prior to this meeting so that they would have a chance to
19 also participate. You know, maybe they don't have the
20 same view as I do. Maybe you would benefit from
21 something they might say, too. But in County procedures,
22 when a simple thing like zoning is changed, they have to
23 by law notify everyone in the immediate area that owns
24 property so that they know what's going on and

1 participate. And if I'm not mistaken, I believe some air
2 and water permits from the EPA require large facilities
3 to keep the public informed as to what's going on in
4 their facilities. So, that might be an idea. I would
5 hope it would be, that it would be more an automatic
6 thing to give the information to the local people rather
7 than make them seek it out. ...

RESPONSE

DOE announced the availability of this EIS and the time and place of the public meeting several ways. DOE mailed a pamphlet to stakeholders on a mailing list from the DOE Chicago Area Office. The pamphlet offered the recipient a copy of the entire DEIS or a copy of the summary. DOE also announced the public meeting in the cover letter transmitting the DEIS and in several local newspapers.